12-15-1982

Report Concerning Reserved Water Right Claims

Teno Roncalio
Special Master, District Court of the Fifth Judicial District, State of Wyoming

In The

District Court of the Fifth Judicial District State of Wyoming

IN RE: THE GENERAL ADJUDICATION OF ALL RIGHTS TO USE WATER IN THE BIG HORN RIVER SYSTEM AND ALL OTHER SOURCES, STATE OF WYOMING.	)))))	Civil No. 4993

Teno Roncalio, Special Master

REPORT

Concerning Reserved Water Right Claims
By and On Behalf of The
Tribes of the Wind River Indian
Reservation, Wyoming

DECEMBER 15, 1982

TABLE OF CONTENTS

PART ONE

		Page
I.	INTRODUCTORY STATEMENT	1
	A. The Winters Doctrine	4
	B. A Note On Jurisdiction	8
II.	HISTORY OF THE CASE	13
	A. Complaint and Service of Process	13
	B. Referral to Special Master	20
	C. Stipulation on Confirming Rights	24
	D. Contested Issues	27
III.	BOUNDARIES AND DATES	31
	A. The "Lander" Purchase	33
	B. The "Thermopolis" Purchase	34
	C. The 1905 Act	35
	D. Priority and Alienation	44
	1. The Initial Conveyance	45
	2. Reacquisition By Tribes	49
	3. Reacquisition By Non-Indian Entity	49
	E. Conclusions	54
IV.	INTENT AND PURPOSES	56
	A. Intent	56
	1. Fort Belknap Reservation	57
	2. The Wind River Indian Reservation	59
	3. Equal Footing Doctrine	62
	B. Purposes	64
V.	WIND RIVER INDIAN RESERVATION CLAIMS FOR WATER	72
	A. As Advanced By The United States	72
	B. As Advanced By The Tribes	82

PART TWO

		Page
I.	THE DETERMINATION OF PRACTICABLY IRRIGABLE ACRES ON THE RESERVATION'S HISTORIC LANDS	87
	A. Introduction	87
	B. Methodology	90
	1. The Case of the United States	90
	2. The Case of the Shoshone and Arapahoe Tribes	100
	3. The Response of the State of Wyoming	101
	C. Adjudicated Lands	105
	D. Unadjudicated In-Use Lands	112
	E. Type VII Lands	117
	F. Type VIII Lands	125
	G. Indian Fee Land	128
	H. Diversion Requirement and Summary on Historic Claims	134
	1. Summary of Detailed Conclusions Regarding Acreage and Diversons	140
	(a) Adjudicated Lands	140
	(b) Unadjudicated Lands	143
	(c) Type VII Lands	146
	(d) Type VIII Lands	149
	(e) Indian Fee Lands	150
	2. Recapitulation of Totals From Preceding Tables	152
II.	THE DETERMINATION OF PRACTICABLY IRRIGABLE ACRES ON THE RESERVATION'S FUTURE LANDS	153
	A. Introduction	153
	B. Test for Practicably Irrigable Acres	155
	1. Based on Present Standards	156
	C. Arability	156
	1. Classifications	163
	(a) North Crowheart Area	163
	(b) South Crowheart Area	163
	(c) Big Horn Flats Area	164
	(d) Riverton East Area	165

Page

(e) Owl Creek Area 165
(f) Arapahoe Area 165
2. Summary of Acreage Totals After Arability Test 166
D. Engineering Feasibility 166
1. The 11 Point Analysis 167
(a) Climate Zones 168
(b) Cropping Patterns 169
(c) Evapotranspiration 170
(d) On Farm System Design, Drainage, and Remaining Points 172
(e) Difference in Costing Methods 173
2. Summary of Acreage Totals After Engineering Test 178
E. Diversion Requirement 178
1. United States' Assertions by Project 179
2. Overall Efficiency Percentage 180
3. Summary of Acreage Totals After Engineering Test 182
F. Economic Feasibility 183
1. Evaluation of Crop Yields 183
(a) Patterns 184
(b) Production Costs 187
2. Machinery and Equipment 189
3. Labor Costs 192
4. Management Costs 194
5. Normalization Process 196
6. The Discount Rate 198
7. Conclusion and Summary of the Final Measure of Award After Economic Tests 205
G. Limitation on Exporting and Construction Schedules 205
1. Exporting 205
2. Limitation on Construction Schedules 208

III. THE DETERMINATION OF PRACTICABLY IRRIGABLE ACRES ON THE RESERVATION'S ADDITIONAL TRIBES FUTURES 211

PART THREE

		Page
I.	GROUNDWATER	219
	A. The Cappaert Decision	222
	B. Mineral Reservation Claim	228
	C. Water is Not Land	229
	D. Evaluation of Resources	230
	E. Summary and Award	234
II.	FISHERIES, WILDLIFE AND AESTHETICS	239
	A. Wildlife and Aesthetics	239
	B. Fisheries	242
	1. Stream Reach Distinctions	248
	2. Exclusive Storage Claim	250
III.	ESTOPPEL	253
IV.	EFFECT ON STATE WATER RIGHTS	257
	A. Acts of Congress	257
	B. The Worland Hearing	259
	C. The Fassett Model	260
V.	FINDINGS OF FACT AND CONCLUSIONS OF LAW	267
	A. Boundaries and Dates	268
	B. Intent and Purposes	217
	C. Historic Lands	275
	1. As Applied to Categories of Land	275
	2. As Applied to Projects, Canals or River Basins	280
	(a) Upper Wind Unit	280
	(b) Litte Wind Unit	282
	(c) Separate Units	284
	(d) Irrigation Districts	285
	(e) Project Land Totals	286
	(f) Non-Project Lands	286
	(g) Wind River Basin	287
	(h) Litte Wind River Basin	292
	(i) Bighorn River Basin	297

Page

(j) Popo Agie River Basin..... 299
(k) Owl Creek Basin 301
(l) Non-Project Land Totals 303
3. Recapitulation 305
D. Future Lands 306
E. Additional Tribes' Futures..... 316
F. Groundwater 317
G. Fisheries, Wildlife and Aesthetics 320
H. Estoppel 322
J. Effect on Water Rights 323

VI. RECOMMENDED DECREE 327

APPENDICES

Appendix 1 - Wind River Indian Reservation Boundaries Stipulation
Appendix 2 - Glossary
Appendix 3 - Index of Witnesses
Appendix 4 - Index of Exhibits

CASES: Page

Arizona v. California Special Master's Report, No. 8 Original, S.C. Oct. Term, 1981, p. 64..... 27, 31, 32 153, 156, 213
Arizona v. California, 373 U.S. 546, 10 L.Ed.2d 542, 83 S.Ct. 1468 (1963)..... 31, 153 155, 156
Ash Sheep Co. v. United States, 252 U.S. 159, (1920)..... 39-41
Blackburn v. State, 357 P.2d 175 (Wyo. 1960)..... 43

Cappaert v. United States, 426 U.S. 128, 48 L.Ed. 2d 523, 96 S.Ct. 2062 (1976)..... 50, 222-225, 260
Colville Confederated Tribes v. Walton, 460 F.Supp 1320 (1978)..... 45, 46 50-54, 245
Colville Confederated Tribes v. Walton, 647 F.2d 42 (9th Cir. 1981)..... 45, 46 51-53, 245
DeCoteau v. District County Court, 420 U.S. 425, 43 L.Ed.2d 300, 95 S.Ct. 1082 (1975)..... 42
Jicarilla Apache Tribe v. United States, 601 F.2d 1116 (1979), cert. denied 444 U.S. 995 (1979)..... 12
Mattz v. Arnett, 412 U.S. 481, 37 L.Ed. 2d 92, 93 S.Ct. 2245 (1973)..... 38, 42

Menominee Tribe v. United States, 391 U.S. 404, (1968)..... 37, 245

Merrill v. Bishop, 69 Wyo. 45, 237 P.2d 186 (1951)..... 46, 59
Merrill v. Bishop, 74 Wyo. 298, 287 P.2d 620 (1955)..... 46, 49 55, 59
The Northern Cheyenne Tribe v. Adsit, 668 F.2d 1080 (C.A. Mont. 1982)..... 9, 10
Rosebud Sioux Tribe v. Kniep, 430 U.S. 584, 51 L.Ed. 2d 660, 97 S.Ct. 1361 (1977)..... 42, 43
San Carlos Apache Tribe of Arizona v. State of Arizona, 668 F.2d 1093 (C.A. Ariz. 1982)..... 9

CASES: Page

Seymour v. Superintendent, 368 U.S. 351,
7 L.Ed.2d 346, 82 S.Ct. 424 (1962)..... 42
Sporhase v. Nebraska ex rel. Douglas, -- U.S. --,
73 L.Ed.2d 1254, 102 S.Ct. -- (1982)..... 237, 238, 239
State v. Moss, 471 P.2d 333 (Wyo. 1970)..... 43
United States v. Adair, 478 F.Supp. 336 (D.Or. 1979) 46
United States v. Ahtanum Irrigation District,
236 F.2d 321 (9th Cir. 1956) 46
United States v. Anderson, slip opinion
No. 3643 (E.D. Wash. July 23, 1979) 45, 245

United States v. Celestine, 215 U.S. 285,
54 L.Ed. 195, 30 S.Ct. 93 (1909)..... 37, 42

United States v. District Court In and For
County of Eagle, Colorado, 401 U.S. 520,
28 L.Ed. 2d 278, 91 S.Ct. 998 (1971) 63
United States v. Hampleman, No. 743
(D.Wyo. June 25, 1916) 45
United States v. Hibner, 27 F.2d 909 (D.Id. 1928)..... 45
United States v. New Mexico, 438 U.S. 696,
57 L.Ed. 2d 1052, 98 S.Ct. 3012 (1978)..... 245
United States v. Powers, 305 U.S. 527, (1939)..... 45
United States v. Santa Fe Pacific Railroad Co.,
314 U.S. 339, (1941) 37
United States v. Seaton, 248 F.2d 154
(10th Cir. 1955) 228
United States v. Shoshone Tribe,
304 U.S. 111, 82 L.Ed. 1213 (1938)..... 69-71
United States v. Texas, 339 U.S. 707,
94 L.Ed. 1221, 10 S.Ct. 918 (1950)..... 63-64
Winters v.United States, 207 U.S. 564,
52 L.Ed. 340, 28 S.Ct. 207 (1908)..... 4, 7, 31
32, 44, 46
56-62, 68, 72
105, 112, 206
209, 233
251, 255

CONSTITUTIONAL PROVISIONS: Page

Wyoming Constitution 3, 229, 250
Wyoming Constitution, Art. 8, Secs. 1, 3..... 60
Wyoming Constitution, Art. 21, Sec. 26..... 8, 9, 49

STATE STATUTES:

Wyoming Statutes Sections 41-4-317, 318
(1977 as amended)..... 3, 82
Wyoming Statutes Section 1-37-106 (1977) 14-16
Rule 53, Wyoming Rules of Civil Procedure 21

UNITED STATES STATUTES:

The Homestead Act of 1862 (12 Stat. 392, Chap. 75)..... 257
Treaty of July 3, 1868 (15 Stat. 673)..... 6, 32, 37
50, 54, 57
59-62, 64-71
241, 245
The Desert Lands Act of 1877
(19 Stat. 377, Chap. 107) 258
General Allotment Act (24 stat. 388, Chap. 119)..... 7, 46
Agreement of May 1, 1888 a/k/a Fort Belknap Treaty
(25 Stat. at L. 113, Chap. 213)..... 57, 59
Wyoming Act of Admission, 1890 (26 Stat. 222)..... 60, 61
The Brunot Agreement a/k/a The Lander Purchase,
December 15, 1894 (18 Stat. 291)..... 33, 34
39, 55
The Carey Act of 1894 (28 Stat 422, Chap. 301,
Sec. 4)..... 258
The First McLaughlin Agreement a/k/a The
Thermopolis Purchase (30 Stat. 93 (1897))..... 34, 39, 55
The Reclamation Act of 1902 (32 Stat. 388,
Chap. 1093)..... 258
Act of April 27, 1904..... 39, 40, 42

UNITED STATES STATUTES: Page

The Second McLaughlin Agreement a/k/a
The 1905 Act (33 Stat. 1016) 35-39, 41
43, 44, 228
Act of 1907 (34 Stat. 1034) 39, 42
Act of 1910 ..... 39, 42
Act of August 21, 1916 (39 Stat. 519) 228
Stock-Raising Homestead Act of 1916
(39 Stat. 862, Chap. 9) 257
Acts of June 5, 1920 and March 4, 1921
(41 Stat. 874, 915, 1367, 1404) 228
Act of August 15, 1953 (67 Stat. 592) 39, 42
228
Act of August 27, 1958 (72 Stat. 935) 228
McCarran Amendment, (66 Stat. 556, Chap. 651,
Title II, Sec. 208(a)-(c) 9, 12, 13
17-19, 48, 237

TEXTS AND PERIODICALS:

66 American Bar Association Journal 50 27
Jones, Burr W., The Law of Evidence in
Civil Cases, 2nd Ed., Sec. 390 at p. 491,
April 1912 (Bancroft-Whitney, SF) 214
Note, "Indian Reserved Water Rights:
The Winters of Our Discontent,"
88 Yale L.J. 1689 (1979) 7

LAND DEFINITIONS

TYPES - USED TO TYPE IRRIGATED LANDS

TYPE I - INTENSIVELY IRRIGATED CROPLAND.
Usually have an adequate or nearly adequate water supply. Generally devoted to raising row crops or crops in rotation. Irrigation systems are generally well developed and maintained.

TYPE II - IRRIGATED CROPLAND WITH AN ADEQUATE WATER SUPPLY.
Generally devoted to raising hay crops or hay, small grains and pasture. Irrigation systems may not be as well developed and maintained as Type I.

TYPE III - MEADOW IRRIGATION.
Usually have an adequate early season water supply and may have an adequate year around supply. Usually located at higher elevations and are devoted to raising native or improved grass-legume hay. Irrigation systems are generally poorly developed and continuous irrigation is common.

TYPE IV - OCCASIONALLY IRRIGATED, PARTIAL SERVICE.
Lands irrigated sporadically or irregularly by water spreading systems or by conventional systems. Water supply may be limited. Native hay and pasture are the usual land uses.

TYPE V - SUBIRRIGATED OR "SEEPED" LANDS.
Also referred to in this case as "Circle V" lands. Are not intentionally irrigated by receive sufficient water from adjacent irrigated lands, canals, and/or from streams to provide beneficial use.

TYPE VI -
Lands irrigated sporadically or irregularly by conventional systems. They are poor quality and require a higher level of irrigation management. Water supply is adequate. Native hay and pasture are the usual land uses.

TYPE VII - IDLE LANDS.
Lands once irrigated but not being currently used for irrigated crops.

TYPE VIII - UNDEVELOPED ARABLE LANDS WITHIN WIND RIVER FEDERAL IRRIGATION PROJECTS (FIP's).
Lands which have never been developed but which are of a type capable of production, located near an existing water delivery system.

CLASSES - USED TO CLASS ARABLE LANDS

CLASS 1 - Lands of high quality for irrigation which will yield high returns with minimum production and management costs.

CLASS 2 - Lands of good quality with only minor deficiencies.

CLASS 3 - Lands of fair quality having more serious deficiencies than Class 2 lands.

CLASS 4 - Lands of marginal quality for irrigation, suitable mainly for shallow rooted crops or pasture.

CLASS 5 - Lands which have been placed into a deferred status pending further investigation.

CLASS 6 - Lands which do not meet the minimum standards or requirements for arability under the Land Classification Standards used by HKM, and are non-arable.

PART ONE

PART ONE

I. INTRODUCTORY STATEMENT

This is a lawsuit brought by Wyoming to adjudicate all rights to the use of water in the Big Horn River system and all other sources within Water Division No. 3 of the State.

Water Division No. 3 is for all practical purposes identical with what is known as the Big Horn River drainage basin. By statutory definition it also includes the Clark's Fork drainage and tributaries. It includes many Federal entities, the largest being the Wind River Indian Reservation, and the Shoshone and Big Horn National Forests. Others include the East Fork Winter Elk Pasture, the Sheridan County Elk Winter Pasture, the Yellowtail Wildlife Habitat Management Area, the Middle Creek Drainage Area of Yellowstone National Park, the Big Horn Canyon National Recreation Area, and numerous water public reserves, water wells and stock driveways upon Federal lands administered by the Bureau of Land Management (BLM).

Division 3 also includes all tributaries to the Wind River. The Wind River travels from its origin southeasterly, draining the eastern slopes of the Continental Divide and westerly inclines of the Owl Creek Mountains. It then curves south of the Riverton area and begins a route northeast to the Montana line. As it travels through the geologically famous canyon north of Boysen Reservoir, its name becomes the Big Horn. Division 3

includes the remainder of its course and all of its tributaries in Wyoming.

The evidence is undisputed that Wyoming has traditionally administered water laws in full accord with her statutory doctrine of prior appropriation - first in time, first in right. State officials have brought administrative and judicial proceedings to cancel water rights they knew to be totally non-used or otherwise in violation of State law.[1] Wyoming requires annual reports from her water officials within the province of the State Engineer, and requires reports of County officials regarding water usage in their particular jurisdictions.

Water Division 3's Chief Administrative Officer is a Superintendent directly responsible to the State Engineer. He has several people working under him who are water commissioners or hydrographers, and the State employs one such hydrographer in Division 3. The rest of the employees concerning the distribution of the use of water in Wyoming are called water commissioners, and are employed by the County. There are approximately 11 so employed in Water Division 3. In addition to his chief duties within the Division, a Water Division Superintendent sits as a member of the State Board of Control. Wyoming is divided into four such Water Divisions and those Commissioners, plus the State Engineer, constitute her Board of Control.[2]

Excluding the United States, as trustee for the Tribes, and the Wind River Indian Reservation Tribes, several thousand defendants in this action hold an interest in over 812,000 acres of farm and ranch lands in the Big Horn Basin of Wyoming (Division 3). In rounded figures as of the end of 1981, about

1. Tr. p. 121, November 26, 1979.
2. Plaintiff's Exhibit AP-3, see Tr. p. 157, November 26, 1979.

653,513 acres received water by virtue of adjudicated rights and 158,217 by permits (unadjudicated rights).[3] Volumes delivered vary, of course, from year to year depending upon nature and priority dates involved.

A Commissioner's duty is to deliver water to appropriators entitled to water in priority. On years of "abundant" water, defined as flowing stream water in excess of that amount necessary to satisfy all existing pre-1945 appropriations on said stream, appropriators may take an additional cubic foot per second over and above the statutory limitation or quantification of one cubic foot per second per seventy acres.[4] In such areas on given wet years, there is a minimum of regulation and supervision. In years of scarcity or low flows, regulation and supervision increases accordingly.[5]

Nothing in Wyoming's laws provides a right to the use of water for any Federal entity unless that right conforms to State law as in the case of any other water user. In other words, Wyoming does not recognize a reserved right inuring to the benefit of the United States, whether as a proprietor or as a guardian of installations or of peoples located within Water Division 3. This is an accepted fact that has existed since the adoption of the Wyoming State Constitution by Congress and her admission as a state in 1890.

Federal officials in charge of the first irrigation and reclamation projects in Wyoming understood this western water concept and filings were made in the office of the State Engineer for the irrigable acreage of the respective Federal projects

3. Tr. p. 15255.
4. W.S. 41-4-320.
5. Christopulos, Tr. 121 et seq. See also W.S. 41-4-317, 318.

as each was established in Wyoming.[6] As is later detailed in several portions of this Report, with the opening of the ceded land of the Wind River Indian Reservation in 1905 and its settlement by non-Indians, there began to be filings in the State Engineer's office for certain Indian lands in behalf of Indians in the "diminished" or remaining portion of the Reservation.

A. THE WINTERS DECISION

About this same time, controversy between settler and Indian came to a head in Montana and grew into a dispute that found its way to the United States Supreme Court in 1907. On January 6, 1908, the United States Supreme Court in Winters v. United States, passed down a decision which is still reverberating throughout the western United States.[7]

6. The northern portion of Division No. 3 contains one of the first Federal irrigation projects in the Nation, the Shoshone Project authorized by the Secretary of Interior, February 19, 1904. It is served by State awarded water rights which date from November 5, 1905. One of the first irrigation districts in the Nation, far predating the Federal projects, is the Cody Canal served by State water rights dating as early as 1896.

7. Winters v. United States, 207 U.S. 564 (1908). For a thorough discussion of this momentous matter and its effect, see Scott M. Matheson, Jr., "Indian Reserved Water Rights," The Winters of Our Discontent, 88 Yale Law Journal, 1698-1712 (1979). I am indebted to Professor John Hinckley of Powell, Wyoming, for Volume XIII, Western Historical Quarterly No. 1, published by Utah State University, with an article by Norris Hundley Jr., entitled "The Winters Decision and Indian Water Rights, a Mystery Reexamined" (1982). This article provided the following "sampling" of "decisions and literature stemming from Winters reflecting the confusion and documenting the larger importance of the Indian water rights question for the nation" [S]ee Conrad v. United States, 161 F. . . .(cont.)

Pages of this report and many hours of the trial in this adjudication are devoted to the proposed final application of that doctrine in Wyoming. The State argues that there is no

7. (continued)...829 (9th Cir. 1908); United States v. Walker River Irrigation District, 104 F.2d 334 (9th Cir. 1939); United States v. Ahtanum Irrigation District, 236 F.2d 321 (9th Cir. 1956); Arizona v. California, 373 U.S. 340 (1963); Harold A. Ranquist, 'The Winters Doctrine and How It Grew: Federal Reservation of Rights to the Use of Water,' Brigham Young University Law Review, 3 (1975), 639-724; Michael C. Nelson and Bradley L. Cooke, 'The Winters Doctrine; Seventy Years of Application of 'Reserved' Water Rights to Indian Reservations,' University of Arizona Arid Lands Resource Information Paper No. 9 (Tucson, 1977); Edward W. Clyde, 'Indian Water Rights,' Robert Emmet Clark, ed., Waters and Water Rights: A Treatise on the Law of Waters and Allied Problems (7 vols., Indianapolis, 1967-1976), II, 373-99; James L. Merrill, 'Aboriginal Water Rights,' Natural Resources Journal, 20 (January 1980), 45-70; Rupert Costo, 'Indian Water Rights: A Survival Issue,' Indian Historian, 5 (Fall 1972), 4-6; William H. Veeder, 'Water Rights: Life or Death for the American Indian,' Indian Historian, 5 (Summer 1972), 4-9; Rosalie Martone, 'The United States and the Betrayal of Indian Water Rights,' Indian Historian, 7 (Summer 1974), 3-11; William H. Veeder, 'Indian Prior and Paramount Rights to the Use of Water,' Rocky Mountain Mineral Law Institute Proceedings, XVI (1971), 631-68; Paul Bloom, 'Indian "Paramount" Rights to Water Use,' ibid., 669-93; Monroe E. Price, Law and the American Indian: Readings, Notes and Cases (Indianapolis, 1973), 310-29; Eva H. Morreale, 'Federal-State Rights and Relations,' Clark, ed., Waters and Water Rights, II, 59-61; Wardlaw, 'Irrigable Acres Doctrine,' 375-84; Robert D. Dellwo, 'Indian Water Rights -- The Winters Doctrine Updated,' Gonzaga Law Review, VI (1971), 215-40; Harry B. Sondheim and John R. Alexander, 'Federal Indian Water Rights: A Retrogression to Quasi-Riparianism?,' Southern California Law Review, XXXIV (1960), 1-61; Peter C. Maxfield, Mary Frances Dieterich, and Frank Trelease, Natural Resources Law on American Indian Lands (Boulder, Colorado, 1977), 207-38; John Patterson, 'Extent of Indian Water Rights on Reservations in the West,' Rocky Mountain Law Review, XVIII (1946), 427-30; Richard L. Foreman, Indian Water Rights: A Public Policy and Administrative Mess (Danville, Illinois, 1981)."

reserved right for Indians and, if any, their reserved rights date is the date of State awarded permits granted to them prior to and during the Winters Doctrine era. The United States and the Tribes argue that the Winters Doctrine results in an entitlement with an 1868 priority date to the Indians of water for all of its historically irrigated lands plus an award of water in quantities to irrigate all practicably irrigable acres on the Reservation, twenty percent (20%) thereof for future generations, plus reserved water for other uses.[8] Winters provides that a reservation of water in favor of Indians will be implied from the Treaty whereby the Indians, having the right to occupy and use vast areas of land, ceded to the United States all those lands except the relatively small tract which was set apart for their Reservation. As is usual in such magnificent pronouncements, there was no actual quantification of water, nor a rule provided to serve as a guide in scope or effect in litigation such as this.

Winters held that the Treaty date - in Water Division 3 this would be July 3, 1868 - implicitly reserved from appropriations under State law an amount of water sufficient for irrigation purposes, "which would be necessarily continued through the years, its priority relating back to the Treaty date." Winters rejected the notion that Congress' admission of the State to statehood abrogated the reservation of waters.

For over 100 years citizens of the Territory and of Wyoming in the Big Horn Basin have lived either adjacent to Indians near or on ceded lands within the parameters of the Indian Reservation, or downstream of the Reservation along the remainder of what is known as the Big Horn Basin, northward

8. For a detailed statement of claims of the Tribes and of the United States on behalf of the Tribes, see infra, (Indian Claims); also, see summary under "Groundwater", infra.

to the Montana Line. In 1905 the Riverton Reclamation Project and ongoing homestead laws brought thousands of non-Indian settlers to the area. In a few instances over the decades, Indians who had taken lands in fee under the General Allotment Act, had conveyed to non-Indians, thus creating yet another class of water users with unique legal problems of their own.

As stated in the Scott M. Matheson, Jr., treatise referred to on several occasions in this report, the water law system of Wyoming cannot "readily accommodate the Winters Doctrine because the Indian reserved right is not limited by the same conditions as an appropriation right." Legal recognition of the Indian reserved right occurred 75 years ago, but important questions about the right's basic elements continue to remain unanswered and cause numerous serious, continuing disputes. "Neither courts nor legislatures nor agencies have defined the two key elements of the Winters right: its scope, including quantity of water effected and the priority of that right in its uses, including transferability of the right and permissible applications of Winters water on the Indian Reservation, and on ceded portions no longer in control of the Reservation."[9]

In 1975 on lands originally ceded in 1905, and long since conveyed to non-Indian ownership, currently used as the Riverton Municipal Airport, authorities planned the drilling of water wells to augment supplies for the airfield and a proposed industrial park. They were notified by Tribal authorities that the Wind River Indian Reservation asserted a claim upon groundwaters under the Riverton Municipal Airport as a part of their "Winters" water and objected to such drilling.[10]

---

9. Indian Reserved Water Rights: the Winters of Our Discontent, 88 Yale Law Journal, 1689, (1979).
10. Mr. Long, City Manager, Riverton, Tr. p. 13573.

Thus, once again, the original, unresolved fundamental dispute that has existed in the Rocky Mountain West for over 70 years asserted itself in Wyoming. While a general deterioration of communication between the Wind River Indian Reservation Indians and the non-Indians of Fremont County may have been a factor, it was a minimal one. It was obvious that an adjudication was at last necessary which would once and for all quantify, define, and integrate the rights of all people, Indian and non-Indian, to the use of waters in Water Division 3. It is appropriate that such an adjudication take place here.

It was in the above fertile soil of a justiciable dispute in Wyoming, and a century old, unanswered determination throughout the entire Rocky Mountain West, that the seeds of controversy were planted, out of which this action grew.

B. A NOTE ON JURISDICTION

Although the matter of jurisdiction has been reserved on appeal, it is necessary to include the following matters in support of jurisdiction vesting in the Courts of the State of Wyoming for a general mainstream adjudication quantifying the rights on all Federal enclaves within Division 3 of the State of Wyoming.

The issue here stems from the fact that Wyoming, as with most other Western states, has what is called "specific disclaimer" language in her Constitution.[11]

---

11. Wyoming Constitution, Article 21, Section 26, reads in part: "The people inhabiting this state do agree and declare that they forever disclaim all right and title to the unappropriated public lands lying within the boundaries thereof, and to all lands lying within said limits owned or held by any Indian or Indian tribes, and that . . . (cont)

Because the subject matter of this litigation is the right to the use of water and not a matter directly affecting possession, control, taxation or ownership of land, it is my opinion that due to the McCarren Amendment, jurisdiction does lie with the state to adjudicate and to quantify water rights of all the users in Wyoming, though they may be Federal wards or residing on lands that are specifically excluded from the jurisdiction of the State of Wyoming. The McCarren Amendment is the basis for bringing this legislation and so long as the general mainstream adjudication is a comprehensive one, which it has been in this case, we believe jurisdiction is solid.

This is not withstanding the recent decisions, San Carlos Apache Tribes v. State of Arizona (decided February 23, 1982), and The Northern Cheyenne Tribe vs. Adsit (decided February 22, 1982), both in the United States Court of Appeals for the Ninth Circuit.[12]

In said cases, the United States and various Indian tribes appealed from Orders entered by the respective Federal District Courts dismissing actions brought to adjudicate Federal and Indian water rights in Federal Courts in favor of the State Court proceedings which were then under way. The Appellate Court held that the McCarren Amendment did not grant jurisdiction and invoked the language which expressly disclaimed jurisdiction over Indian lands, contained in the Constitution and

11. ...(continued) until the title thereto shall have been extinguished by the United States the same shall be and remain subject to the disposition of the United States and that said Indian lands shall remain under the absolute jurisdiction and control of the Congress of the United States..."

12. San Carlos Apache Tribe of Arizona v. State of Arizona, 668 F.2d 1093 (C.A. Ariz. 1982); The Northern Cheyenne Tribe v. Adsit, 668 F.2d 1080 (C.A. Mont. 1982).

enabling acts of the two states involved, Arizona and Montana. I have deliberately underlined the word "lands".

I respectfully urge that the disclaimer does not state that "the right to the use of water" is disclaimed. The disclaimer runs to land only.

In the Adsit case cited above, a dissenting opinion by Judge Merrill was read with interest because of its direct bearing on these proceedings. Judge Merrill concurred with the District Court and stated that a water adjudication is essentially a local concern and in every western state water scarcity poses a problem not just to Indians, but to everyone. In his view it is highly important that each state be accorded room for an effort to solve its water scarcity problems in the manner it regards as most appropriate. His language which has direct relation on this case is as follows:

> "..here as long as Montana gives recognition to Indian water rights and their establishment pursuant to Federal law, I see no good reasons why Indians should not be joined with all other water users in the state in order to achieve a comprehensive state adjudication."

The last paragraph of this dissent is crucial. It begs the very question which turns on a state adjudication giving recognition to Indian water rights. This is one of the basic controversies in a general mainstream adjudication, the recognition that a federal reserved water right is an issue in these matters, not a prerequisite to state jurisdiction.

Wyoming in this case begins its "defense" by not recognizing any Indian reserved water rights, but she is careful to continue by asserting that if these rights do exist, a careful application of strict proof, and of examination of the respective

claim, is in order before they should be quantified, given a priority date, and recognized by any court, State or Federal.[13]

I believe jurisdiction is solidly within the State of Wyoming and should be preserved and confirmed on appeal because these proceedings have been in every manner a comprehensive general mainstream adjudication. In support of this statement, it is stressed that even basic State Permit 7300, which when issued in 1905 provided water for 300,000 acres, has since been reduced by the State Engineer to about 100,000 acres when these proceedings began. Upon closer examination by State Engineer George Christopulos in these proceedings, State Permit 7300 has further been reduced to now serve less than 70,000 acres.[14]

Similarly, at least seventeen adjudicated state water rights have been found to be abandoned and recommended to be cancelled as a result of the adjudication which began in the upper reaches of Water Division 3.[15] Had it not been for the stipulation which the United States and the Tribes entered into with the State, which made moot any further examination of right by right adjudicated water rights in that area pending my ruling on Boundaries and Dates, we would have proceeded to examine each and every water right in Water Division 3 as carefully as was initiated in the beginning of these proceedings. The stipulation removed the need for the continuance of such an examination.

---

13. See Section entitled "Futures", infra.
14. Tr. p. 15239. Permit 7300 is the "foundation" permit for the Riverton Reclamation Project.
15. See Masters Exhibit No. 1, and State Engineer's letter amendment thereto, showing abandoned rights.

For this reason, I believe Wyoming has a right under the McCarren Amendment to conduct these proceedings, and hope that this vital adjudication of the right to use water in Water Division 3 not become a nullity by a ruling of any court that the State disclaimer serves to repeal the McCarren Amendment.

The Ninth Circuit cases cited above are in direct conflict with the Tenth Circuit, whose thorough opinion on June 22, 1979 serves to buttress the position of valid jurisdiction of this case in Wyoming courts.[16]

16. Jicarilla Apache Tribe v. United States, 601 F.2d 1116 (1979), Cert denied, 444 U.S. 995 (1979).

II. HISTORY OF THE CASE

A. COMPLAINT AND SERVICE OF PROCESS

The complaint in this massive and difficult matter was filed in the District Court of the Fifth Judicial District of Wyoming, in Worland, Washakie County, on January 24, 1977, by Wyoming Attorney General V. Frank Mendicino, acting "on behalf of the State of Wyoming and under the direction of the Governor of the State of Wyoming. . . ." The origin of this case lies in legislative actions taken by the United States Congress in 1952 and the Legislature of the State of Wyoming in 1977.

With the passage in 1952 of the so-called McCarran Amendment,[17] Congress waived the sovereign immunity of the United States "in any suit (1) for the adjudication of rights to the use of water of a river system or other source, or (2) for the administration of such rights, where it appears that the United States is the owner of or is in the process of acquiring water rights by appropriation under state law by purchase, by exchange, or otherwise, and the United States is a necessary party to such suit."

Twenty-five years later, in preparation for this litigation and in an effort to perfect service and further secure jurisdiction over the United States and the Shoshone and Arapahoe

17. 43 U.S.C. Section 666.

Indian Tribes in her courts, Wyoming considered and enacted the jurisdictional statute under which this case has proceeded. The unanimity by which it became law is, I believe, noteworthy. The legislation was introduced as Original House Bill 188 on January 14, 1977, at which time it was referred to the House Committee on Agriculture, Public Lands and Water Resources. Three days later the Bill was reported from Committee without amendment and considered for the first time by the full body. On January 20 it passed the House 58 to 2 and was sent to the Senate, where it was read for the first time the following day. At that time the Bill was sent to the Senate Committee on Agriculture, Public Lands and Water Resources. It was reported out of Committee to the Senate floor the very same day and passed both second and, under suspension of the Senate Rules, third reading on January 22, 1977, without a dissenting vote. The Bill, still without amendment to its original form, was enrolled and engrossed, signed by the Speaker of the House and the President of the Senate, and then signed into law by the Governor on that same day. This litigation was commenced two days later with the filing of the complaint in the District Court at Washakie County, confining its scope to Wyoming Water Division No. 3.

The jurisdictional statute as passed by the Legislature provides as follows:

> Section 1-37-106. Adjudication of water rights.
>
> (a) The state of Wyoming upon the relation of the attorney general may institute an action to have determined in a general adjudication the nature, extent, and relative priority of the water rights of all persons in any river system and all other sources, provided:

(i) For the purposes of this section:

(A) The term "general adjudication" shall mean the judicial determination or establishment of the extent and priority of the rights to use water of all persons on any river system and all other sources within the state of Wyoming. The court conducting such a general adjudication shall:

(I) Certify to the state board of control those legal and factual issues which the court deems appropriate for the board to determine. Upon such certification, the board shall exercise those powers and follow those procedures set forth in Rule 53 of the Wyoming Rules of Civil Procedure;

(II) Confirm those rights evidenced by previous court decrees, or by certificates of appropriation, or by certificates of construction heretofore issued by the Wyoming state board of control;

(III) Determine the status of all uncancelled permits to acquire the right to the use of the water of the state of Wyoming and adjudicate all perfected rights thereunder not theretofore adjudicated under W.S. 41-211 [Section 41-4-511];

(IV) Determine the extent and priority date of and adjudicate any interest in or right to use the water of the river system and all other sources not otherwise represented by the aforedescribed decrees, certificates, or permits;

(V) Establish, in whatever form determined to be most appropriate by the court, one or more tabulations or lists of all water rights and their relative priorities on the river system and all other sources;

(B) The word "person" shall be construed to mean an individual, a partnership, a corporation, a municipality, the state of Wyoming, the United States of America, or any other legal entity, public or private;

(ii) When the potential defendants number one thousand (1,000) or more, personal service of a summons and complaint shall not be required and (A) the court shall order that the clerk obtain service on known potential defendants by mailing a court-approved notice of the action by certified mail, return receipt requested, and (B) the court shall order that the clerk obtain service on all unknown parties by publication of said notice for four (4) consecutive weeks in a newspaper published in each of the counties within which interests in and rights to the use of water may be affected by the adjudication. If there is no newspaper in one (1) or more of said counties, then publication for such counties shall be in one (1) or more newspapers published in the state, and of general circulation within said counties. If publication is in a daily newspaper, one (1) insertion a week shall be sufficient;

(iii) The complaint for such a general adjudication shall be captioned: "In re the General Adjudication of All Rights to Use Water in the _____ River System and All Other Sources, State of Wyoming";

(iv) When the water rights to be determined are located in more than one (1) county, the general adjudication may be brought in any of the counties.

In accordance with the terms of the statute and with the approval of the Court, service of process was accomplished through mail and publication on the many water rights holders involved and by order of Judge Harold Joffe, service was accomplished on several thousand known water rights holders affected by the action through certified mail, return receipt requested, while all unknown defendants were served by publication pursuant to the newly-enacted provision. The Court ordered publication for four consecutive weeks in newspapers published in Natrona, Fremont, Johnson, Washakie, Hot Springs, Park, Big Horn, Sheridan, Sublette, and Teton Counties.

On February 22, 1977, the Department of Justice filed in the United States District Court for the District of Wyoming a petition for removal of the case from the State District Court at Worland to the U.S. District Court in Cheyenne, contending:

> The United States is a party to this action and its rights and those of the Shoshone and Arapahoe Indian Tribes of the Wind River Indian Reservation, Wyoming, under federal law have been made an issue by the complaint in this action. Determination of the extent and priority of the water rights held by the United States in the Big Horn River system both on its own behalf and on behalf of the Shoshone and Arapahoe Indian Tribes will involve substantial and important questions arising under the construction, (sic) laws, and treaties of the United States.

Subsequently, and on motion of the State of Wyoming and two private parties, Mr. Landis Webber and the Owl Creek Ranch, Federal Judge Ewing T. Kerr remanded the case to the State Court at Washakie County, concluding that the jurisdictional statute enacted by the Wyoming Legislature providing for adjudications, such as this, fulfills the requirements of the McCarran Amendment that sovereign immunity is waived in such actions where state courts can undertake a comprehensive adjudication of water rights. Judge Kerr concluded:

> In the instant case the congressional policy underlying the McCarran Amendment, the policies enunciated by the Supreme Court, and the procedural defects in the federal governments' removal petition all combine to cast sufficient doubt over the propriety of removal so as to warrant a remand of this cause to the state court.

Significantly, Judge Kerr's order also recognized previous decisions of the United States Supreme Court, holding that

Indian water rights are included among those federal rights which may be adjudicated in a state court under the terms of the McCarran Amendment.[18]

With the matter remanded, the United States then filed a motion to dismiss the complaint. Said motion to dismiss was argued by the United States on the following bases:

> (1) that the procedure established under Wyoming law for the adjudication did not fit within the meaning of the term "suit" as contemplated by the McCarran Amendment;
>
> (2) that under the terms of the State jurisdictional statute the adjudication was to be submitted for decision to the State Board of Control, and that such agency of the State government was not in a position to render an unbiased and fair decision in the case; and
>
> (3) that certain provisions of the Wyoming Constitution preclude the Court from exercising jurisdiction over the waters involved in this adjudication.

In support thereof, the Shoshone and Arapahoe Indian Tribes sought leave of the Court to file a brief amicus curiae, which motion was granted despite formal opposition of the State of Wyoming. In its amicus brief, the Tribes argued that because of a conflict of interest between the United States and the Indian rights, the U.S. could not adequately represent the Tribes as their trustee. Additionally, the Tribes asserted that

18. In Re Bear River Drainage District, 267 F.2d 847 (10th Cir. 1959); New Mexico v. United States, Civil No. 76-041 (D.N.M., April 21, 1976); State ex rel. Reynolds v. United States, 408 F.Supp. 1029 (D.N.M. 1975); Four Counties Water Users Assn'n. v. Colorado River Water Conservation District, et al., Civil No. 8880 (D.Colo., April 12, 1965); In re Green River Drainage Area, 147 F.Supp. 127 (D. Utah 1956); In re Chiliwist Creek and Its Tributaries, Civil No. 2491 (E.D. Wash., May 29, 1964).

in this action they are an indispensable party and that inasmuch as the McCarran Amendment does not waive the sovereign immunity of the Tribes, they are not subject to service of process and cannot be involuntarily joined in the action. Therefore, the brief concluded "that the Court, sua sponte, should dismiss the case for lack of jurisdiction over a necessary party."

In a written opinion issued December 20, 1977, Judge Joffe rejected all such arguments of the United States and the Tribes, concluding, as did Judge Kerr in his earlier referenced order, that the provisions of the Wyoming jurisdictional statute do in fact provide for an adjudication of water rights within the meaning of the McCarran Amendment and that this State Court has jurisdiction over the matter. Among other conclusions, Judge Joffe determined that the Shoshone and Arapahoe Tribes are proper parties to the litigation, as the United States is a proper party in its trustee relationship to the Tribes and that the Tribes are not indispensable parties to the litigation.

Concurrently with its consideration of the motion to dismiss, the Court considered as well a motion of the State of Wyoming for summary judgment as to the second and fourth affirmative defenses asserted by the United States in its answer. In those defenses the United States claimed that the Court is without jurisdiction over the subject matter of the action, insofar as the action relates to the adjudication of water rights of the Tribes, and that the case should be dismissed for failure to join an indispensable party. Within the same order denying motion of the United States for dismissal, Judge Joffe granted the motion of the State of Wyoming for summary judgment as to those defenses in the answer of the United States. Tribes preserved for appeal the issue of jurisdiction.

B. REFERRAL TO SPECIAL MASTER

With such jurisdictional matters disposed of, and the parties to the action aligned, the next issue concerned the question of whether or not the adjudication should be certified to the Board of Control of the State of Wyoming for trial. In pertinent part, the statute required said certification, and the State of Wyoming, on April 18, 1978, requested the Court certify the action to the Board of Control. On August 11, 1978, Judge Joffe signed the First Order of Certification and Referral to Wyoming State Board of Control. Subsequently, upon full consideration of objections to such referral raised by the Tribes and the United States, Judge Joffe altered his initial referral of the matter to the Board of Control, and on May 29, 1979, entered the First Order of Certification and Referral to a Special Master, Teno Roncalio of Cheyenne, Wyoming.

That document charged me with the duty to:

> 1. Determine the status of those rights which are evidenced by previous Court decrees, as set out in Appendix B to the Complaint herein, as well as those rights evidenced by certificates heretofore issued by the Board of Control, as set out in Appendix C to the Complaint herein, which Appendices may be revised to more accurately reflect the records of the State Engineer and State Board of Control.
>
> 2. Determine the status of all uncancelled permits to acquire the right to use of water as set out in Appendix D and Appendix E to the Complaint herein, which Appendices may be revised to more accurately reflect the records of the State Engineer and State Board of Control.
>
> 3. Adjudicate any interest in or right to use the water of the Big Horn River System and all other sources within Water Division No. 3, State of Wyoming, arising under the permits described in paragraph 2, above.

> 4. Determine the extent and priority date of the adjudicate (sic) any other interest in or right to use the water of the Big Horn River System within Water Division No. 3, State of Wyoming, not otherwise represented by the aforedescribed decrees, certificates, or permits, including, but not limited to, any appropriative or reserved rights of the Arapahoe Tribe, Shoshone Tribe, or of the United States in either its proprietary or fiduciary capacity, which may be hereafter identified by said Tribes or the United States and which are not the subject to the decrees, permits and/or certificates described in paragraphs 1 and 2 above.

The Reference directed procedures as set forth in Rule 53 of the Wyoming Rules of Civil Procedure, and ordered the first meeting of the parties be held in Worland, Wyoming at the Junior High School at 9:30 a.m. on the 7th day of August, 1979.

The first Order on Motions then pending, and Establishing Schedule, was issued January 10, 1980.

The pretrial conferences following the first meeting dealt with disposition of many pleadings accumulated during the months of arguments on jurisdiction. Some dealt with procedural matters affecting time, a few on applications for depositions, motions to comply, or motions to compel response; others dealt with motions affecting a priority of schedule.

The most thorny item at this posture of the lawsuit was whether to first proceed with a water right by water right examination of each of the adjudicated and permitted water rights in Water Division No. 3, or to move directly on the quantification of the right to use water of the Wind River Indian Reservation. After due input, hearings began in Worland with an opportunity given to all attorneys of record, attorneys for the United States and the Tribes, and any party

to these proceedings, to call up and to question whatever State water rights they wished. Thus began the adjudication of the right to use water in this Division. The adjudicated State water rights had been assembled in one publication[19] and Wyoming was vigorous in urging that these rights, totaling some 27,000 in number, be confirmed, with certain exceptions.[20]

The motion to confirm said adjudicated rights was held in reserve as hearings began to challenge rights which had been assembled in sets of approximately 2500 rights per set. It was determined that the rights farthest from the boundaries of the Indian Reservation should be called up first, and it was advertised and ordered that any interested party could call up any permit or adjudicated right for examination and make a record for the cancellation or reduction in quantity or right to the use of water of that particular right.[21]

---

19. Master's Exhibit No. 1, a Tabulation of Adjudicated Water Rights of the State of Wyoming, Water Division No. 3.

20. The Harmony Canal Right, Tr. pp. 133, 141 et seq., 11/27/79; to which were later mentioned rights in the name of Frank Hinckley and Glenn Nielson.

21. To again assure that all parties holding state awarded water rights had due notice of the proceedings, an additional notice was agreed upon by counsel for the major parties, and was inserted in all weekly and daily newspapers in Water Division No. 3. It read as follows:

FINAL NOTICE TO ALL OWNERS OF
ADJUDICATED STATE WATER RIGHTS IN
DIVISION NO. THREE, STATE OF WYOMING

Beginning with hearings in October, 1979, attorneys for Wyoming presented evidence to support their motions to confirm all water rights (less a few specific exemptions) contained in a publication entitled "Tabulation of Adjudication Water Rights of the State of Wyoming, Water Division No. 3, 1978."

Concurrent with the above, the United States filed its original Statement of Geographic Boundaries and, in response Wyoming served requests for admissions, interrogatories, and requests for production of documents dealing with said boundaries on all the Federal inholdings in Water Division No. 3. Wyoming demanded strict proof of boundary accuracies, and proof that the Executive Officers of the United States, whose

---

21. (continued)...

> The first set contained approximately 2500 rights, and are located generally in the eastern-most portion of the Water Division. The second set, which was admitted into evidence at hearings in Worland May 5, contains approximately 3000 rights, and are located generally in the center of the Division, extending to the south boundaries thereof and southeast to the Gas Hills area. The third set of hearings will contain the remainder of the above adjudicated water rights and will be offered by the State of Wyoming for confirmation at some future date.
>
> TAKE NOTICE THAT ON APRIL 18 AND AGAIN ON MAY 5TH, ATTORNEYS FOR THE UNITED STATES SERVED NOTICE THAT IN ADDITION TO REBUTTING STATE EVIDENCE IN SUPPORT OF CONFIRMATION OF THESE RIGHTS, THE UNITED STATES OF AMERICA NOW CHALLENGES THE VALIDITY OF ALL WATER RIGHTS IN WATER DIVISION NO. 3. THIS COULD OR COULD NOT AFFECT THE VALIDITY OF ALL WATER RIGHTS IN DIVISION NO. 3.
>
> TAKE FURTHER NOTICE THAT THE NEXT HEARING REGARDING THE ABOVE WATER RIGHTS WILL TAKE PLACE IN WORLAND, WYOMING, ON JUNE 23 AT 10:00 A.M., AND SAID HEARINGS MAY CONTINUE FROM TIME TO TIME AFTER SAID DATE.
>
> IF YOU HAVE NOT ALREADY MADE PROVISIONS FOR REPRESENTING YOUR RIGHTS IN THESE PROCEEDINGS, THIS WILL BE YOUR FINAL NOTICE TO DO SO.
>
> DATED MAY 10, 1980.

signatures appeared upon documents creating said entities, acted within the scope of their authority. One Wyoming query alone contained 196 questions and a request for admission, 184 requests for answers, all dealing with the scope of authority question.[22]

I spare the Court the added bulk if not burden of including in this report any further materials dealing with the pleadings at this stage of the litigation. A series of stipulations, hereinafter mentioned, were entered into by and between the major parties agreeing upon the boundaries of the Wind River Indian Reservation, of the Yellowstone National Park within Water Division No. 3, of the Shoshone National Forest, of the Big Horn National Forest, of the East Fork Elk Winter Pasture, of the Sheridan County Elk Winter Pasture, of the Big Horn Canyon National Recreation Area, of public water reserves, of water wells, stock driveways and wildlife habitat management areas, and other reserves dealing with other Federal enclaves within Water Division No. 3.

C. STIPULATION ON CONFIRMING RIGHTS

To these stipulations was added an additional agreement of all counsel to major parties herein, dealing with the confirmation of adjudicated rights, thus clearing the decks for the trial upon the questions contained in paragraph 4 of the reference.

22. Tr. pp. 23-44, November 26, 1979. It should be noted that the United States was also turning out pleadings of massive proportions. One interrogatory asked 183 questions of Wyoming officials.

The stipulation is as follows:

1. Neither the United States nor the Tribes will raise objections to provisional confirmation of adjudicated rights until after the reserved rights and any of the water rights under Federal law of the United States and the Tribes has been determined by the Master and District Court. No challenge to the United States' or the Tribes' adjudicated rights under Wyoming law shall be made by any party until after the determination of the rights as stated above.

2. After determination of the Tribes' and United States' rights, the Tribes, United States, Wyoming, and any other party shall have a reasonable period of time in which to contest before the Master any provisionally confirmed adjudicated right. The Tribes and the United States may contest only rights which have a higher priority than their reserved rights or other rights held under Federal or State law, and which may have an adverse impact on the exercise of such rights. No such challenge by the Tribes or United States shall result in any change in quantity of water or priority dates for rights of the Tribes, and the United States as determined by the Master and the Court, such matters being left to appeal procedures.

3. The procedures for making such a challenge shall be as follows:

(a) The party asserting the challenge shall have a reasonable time to serve notice in accordance with Wyoming Statute 41-3-401(C), and additionally, upon all counsel of record. The notice shall include:

(1) the permit number and the certificate of appropriation number of each right challenged;

(2) the name and address of the last known holder of each challenged right;

(3) a brief statement of the specific factual basis for each challenge;

(4) the identity of the right of the challenging party which is junior to and which upon which the challenged right has an adverse impact.

(b) As soon as is convenient after notice is served, each challenge shall be set for hearing by notice specifying the rights to be heard on each date. The hearings on the challenges shall be set sufficiently in advance so as to preserve to each party the right to discovery pursuant to the Wyoming Rules of Civil Procedure.

(c) The party asserting the challenge shall have the burden of proving facts sufficient to show abandonment, forfeiture or reduction of the challenged right pursuant to Wyoming law.

(d) Any hearing conducted pursuant to the Stipulation shall be governed by Wyoming Rules of Civil Procedure.[23]

Technically, this cleared the decks for launching the trial upon the claims of the United States, as trustee of the Tribes, except for one glaring reason for continued delay. That was the unprecedented number of documents and depth of inquiry during the interrogatory and discovery proceedings. A few words are in order to touch upon an abusive intrusion in the already much faulted discovery procedures in our judicial system.

It is not meant to add to the current outcry about interrogatory and discovery abuse and the need for reform. This is not the place for suggestions even if I had some. But in my lifetime, except for the Federal anti-monopoly cases recently dismissed or settled, and according to the memory of most counsel herein, no case in our experience has carried so many hours and so many thousands of pages of discovery proceedings involving unprecedented expense to parties on all sides.

23. This Stipulation appears in the transcript as read into the record by Mr. Sachse, Tr. p. 241, June 23, 1980.

Wyoming Supreme Court Justice C. Stuart Brown commented at the time of his swearing in that the discovery proceedings were rendering litigation a route to justice only for the rich, and was denying most citizens their right to courts of law. It is recognized that discovery is at the heart of the problem of delay and the high cost of litigation. Simon H. Rifkind, the Special Master in Arizona v. California, has declared that discovery proceeds today with no serious regulation, and that it has become in many areas of the law a "sporting match and an endurance contest."[24]

The complexity of the oncoming trial, the vast area for fact finding in agricultural and engineering analysis, scientific inquiry of acreage to be proven arable, thence irrigable, and finally practicably irrigable acres, resulted in a time lag of nearly nine months for depositions from the hosts of professional witnesses involved.

It was finally on November 10, 1980 that a Pre-Trial Conference Order was issued and trial set to begin in January, 1981.

D. CONTESTED ISSUES

The Pre-Trial Conference recognized that the United States, essentially realigned as Plaintiff, was asserting water rights for the Wind River Indian Reservation. The Tribes, similarly realigned as Plaintiffs, joined in that claim, but sought a larger quantification than the United States. The Tribes also asserted a reserved right for lands held in fee by Tribal members and their descendants, and for land that had been reacquired, and may be reacquired by the Tribes. The Tribes also

24. 66 American Bar Association Journal 50.

sought an open-ended decree to provide for the unforeseeable future needs and for land not now "irrigably feasible", but which may become "feasibly irrigable" in future times.[25] The State of Wyoming, essentially realigned now as a Defendant, and some of the Defendants other than the United States and the Tribes, contests these claims on both factual and legal bases as set forth in their respective Pre-Trial Statements. The only uncontroverted fact going into the trial was in the stipulation on the exterior boundaries of the Wind River Reservation.

Contested issues of fact included:

(1) The purposes for which lands comprising the Wind River Indian Reservation were withdrawn;

(2) Did Congress intend to reserve water rights on behalf of the Wind River Indian Reservation, and if so, for what purposes;[26]

(3) The number of practicably irrigable acres on the Wind River Indian Reservation;[27] and

(4) The injury to any State awarded water rights resulting from the exercise of federal reserved rights, if the Master finds any such reserved rights to exist.[28]

The contested issues of law included:

(1) Whether the United States, in the creation of the Wind River Indian Reservation, reserved water rights for the benefit of the Tribes;

---

25. Slater, Opening Remarks, Tr. p. 47, January 1, 1981.
26. Issues (1) and (2) are determined in the section of this Report entitled "Intent and Purposes," infra.
27. Issue (3) is determined in the sections entitled "The Determination of Practicably Irrigable Acres on the Reservation Historic Lands" and "The Determination of Practicably Irrigable Acres on the Reservation Future Lands".
28. This question is addressed in the section entitled "Effect on State Water Rights".

(2) If reserved water rights were created in Wyoming, whether the reserved rights doctrine delineates the strict boundaries of those rights;

(3) What is the proper measure of those reserved water rights;

(4) Whether the Equal Footing Doctrine dictates that by admitting Wyoming into the Union on equal footing with the original thirteen states, the United States did not intend to reserve any water in the State of Wyoming;

(5) Whether the United States is estopped from claiming reserved water rights in Water Division No. 3;

(6) Whether the water rights must be quantified once and for all or whether the decree shall left open-ended;

(7) Should the amount to be reserved, if any, be that which is absolutely necessary to prevent the purposes of the Reservation being entirely defeated; or

(a) an amount necessary to fulfill the agrarian purposes only for which the Reservation was created; or

(b) the amount of water sufficient to irrigate all practicably irrigable acres on the Reservation and for related domestic and stock watering uses only; or

(c) whether reserved water rights arise only in connection with the federal reservation of land and may be used only within the boundaries of the land with which it is associated;

(8) What is the quantity of reserved rights that may have been created and whether said quantity, once established, may be used for other purposes; and if so, can a restraint be placed on said other purposes so that the

burden of loss of return flow is not placed on subsequent water users;

(9) What are the priority dates of any reserved water rights which may be found to exist;

(10) What is the priority date on land ceded but later restored to the Tribes; land sold to non-Indians but later re-acquired by or restored to the Tribes; and land sold to non-Indians and still in the ownership of non-Indians;

(11) Whether the Tribes reserved water rights include water for lands held in fee by Tribal members or direct descendants of Tribal members;

(12) Whether the Tribes' reserved water rights include water for land currently owned in fee by non-Indians which the Tribes expect to reacquire in the future;

(13) Are there geographical limits on the use of any reserved water that might be found to exist;

(14) Whether a reserved water right is terminated when it is leased, permitted, licensed or otherwise disposed of to a non-Federal entity or used for achievement of goals separate from those for which the Reservation was originally created and the right originally reserved;

(15) Whether reserved rights apply to groundwater; and

(16) The proper standards and appropriate date, not before 1905, to be used in determining practicability of irrigation.

The treatment of boundaries and dates set forth in the Pre-Trial Order will be dealt with separately in this Report under the title, "Boundaries and Dates", which is next.

III. BOUNDARIES AND DATES

At the outset, it is important to bear in mind the role which the boundary determinations play in this case. This is a water rights case, not a land case. The acreage of the Wind River Indian Reservation is an issue because practicably irrigable acreage is made the measure of the Reservation's water rights. In Winters v. United States, supra, the Court established that the United States, when it creates an Indian reservation, impliedly reserves water for needs of the reservation, and that water rights established subsequent to those of the reservation give way to those of the reservation as its needs expand. The Court applied the Winters doctrine in its original opinion in Arizona v. California, supra, holding that at the time it created the five Reservations at issue there, the United States reserved enough water "to satisfy the future as well as the present needs of the Indian Reservations." 373 U.S. at 600. The Court concluded, agreeing with the Master, "that the only feasible and fair way by which reserved water for the reservations can be measured is irrigable acreage." Id. at 601. The Master's choice of irrigable acreage as a measure was based on the conclusion that it provided an estimate of the amount eventually needed to make the otherwise arid lands productive. The Indians' actual use of the water remains unrestricted. Practicably irrigable acreage, then, is a rough measuring stick, a tool toward an informed equitable estimate of the Indians' needs, both present and future. To use this measuring device,

in turn, it is necessary to know the extent of the Reservation, and to measure the latter, the boundaries. The boundaries are a reference point for an issue itself secondary to the central concern of this case, water rights.[29]

The claims for water by the Shoshone and Arapahoe Indian Tribes are based on the Treaty of 1868 between the government of the United States and the Eastern Band of the Shoshones and the Bannacks. The Treaty, which was executed on July 3, 1868 at Ft. Bridger, conveyed to the Tribes that land:

> (C)ommencing at the mouth of Owl creek and running due south to the crest of the divide between the Sweetwater and Popo-Agie (sic) Rivers; thence along the crest of said divide and the summit of Wind River mountains to the longitude of North Fork of Wind River; thence due north to mouth of said North Fork and up its channel to a point twenty miles above its mouth; thence in a straight line to headwaters of Owl creek and along middle of channel of Owl creek to place of beginning, ..."[30]

Pursuant to the Winters Doctrine, when the United States sets aside a reservation of land for the Indian Tribes, the government impliedly reserves a quantity of then unappropriated water sufficient to fulfill the purposes for which the government created that reservation. The Winters Doctrine also requires that for purposes of establishing a priority date, water reserved in this manner receives the date of the creation of the reservation. The arrival at such a simple conclusion is not

29. The above is a literal paraphrase of the language used by Special Master Elbert P. Tuttle, in his Report in the "second" Arizona v. California case, No. 8 Original, S.C. Oct. Term, 1981, p. 64. It is most appropriately reproduced here.

30. Treaty of 1868: Plaintiff's Exhibit WRIR I & P 1, United States Exhibit WR-1.

possible in this case, however, as a result of conveyances made of lands within the 1868 reservation subsequent to the date of the Treaty.

A. THE "LANDER" PURCHASE

The first such conveyance was the result of an agreement between the Shoshone Indians and the United States called the Brunot Agreement, named for Felix R. Brunot, the chief negotiator for the United States. The Brunot Agreement was executed on September 26, 1872 and ratified on December 15, 1874. The Agreement provided for a cession from the Shoshone Tribe to the U.S. of:

> (T)hat portion of their reservation in Wyoming Territory which is situated south of a line beginning at a point on the eastern boundary of the Shoshone and Bannack reservation, due east to the mouth of the Little Popo-Agie, at its junction with the Popo-Agie, and running from said point west to the mouth of the Little Popo-Agie; thence up the Popo-Agie to the North Fork, and up the North Fork to the mouth of the canyon, thence west to the western boundary of the reservation.

The lands involved in this cession, commonly referred to as the "Lander" Purchase, ceased to be administered as Reservation lands after the ratification date in 1874. The form of the transaction is, I believe, for purposes of this Report, noteworthy. In exchange for the Tribe's agreement to transfer ownership of the above-described lands to the United States Government, the U.S. in turn agreed to pay to the Shoshone Tribe a monetary compensation for the transfer. Once the lands were conveyed and the consideration tendered, neither party had any continuing obligation whatsoever with respect to the other as to the ceded lands.

B. THE "THERMOPOLIS" PURCHASE

The next significant transaction involving the Wind River Indian Reservation was the result of an agreement negotiated by James McLaughlin on behalf of the United States with the Shoshone and Arapahoe Tribes. The agreement is referred to alternatively as the "First McLaughlin Agreement" and the "Thermopolis" Purchase. For the Indians' part, the Shoshone and Arapahoes agreed to:

> (C)ede, convey, transfer, relinquish, and surrender forever and absolutely all their right, title and interest of every kind and character in and to the lands and the water rights appertaining thereunto embraced in the following described tract of country, embracing the Big Horn Hot Springs in the State of Wyoming: All that portion of the Shoshone Reservation described as follows, to-wit: Beginning at the northeastern corner of the said reservation, where Owl Creek empties into the Big Horn River; thence south ten miles, following the eastern boundary of the reservation; thence due west ten miles; thence due north to the middle of the channel of Owl Creek, which forms a portion of the northern boundary of the reservation; thence following the middle of the channel of said Owl Creek to the point of beginning. (Emphasis added.)

The transaction involved approximately 55,000 acres of the Reservation. In consideration of the transfer, the United States agreed to pay to the Tribes the amount of $60,000.00, which amount was to be expended "for the benefit of the said Indians" under conditions set forth in the Agreement. As with the Brunot Agreement of 1872, nothing in the First McLaughlin Agreement placed either party in a position of continuing responsibility or obligation to the other. The transaction was a simple conveyance and purchase transaction, wherein, for payment, the purchaser received full title to the subject lands.

C. THE 1905 ACT

The major controversy with regard to this element of the adjudication centers around the Second McLaughlin Agreement, which is more commonly referred to as the 1905 Act. It is the language of conveyance contained in the Agreement which is at the heart of the controversy with regard to the effect of this transaction. The State of Wyoming contends that the language and the transaction created a disestablishment of certain lands from the body of the 1868 Reservation in such a manner as to preclude the granting of an 1868 priority date for water on those lands which were ceded under the terms of the Agreement. On the other hand, the United States and the Tribes assert that I must look at the Agreement in its entirety and the circumstances surrounding the transaction in order to make a proper determination of the legal consequences of the conveyance. The U.S. and the Tribes, in that context, argue that the Agreement simply provided a type of "power of attorney" whereunder the United States accepted the ceded lands and held those lands in trust for the Indians for resale to other persons, and that the United States maintained a continuing obligation to the Indians with regard to that land. Having given this issue much research and thought, it is my conclusion that the arguments of the United States and the Tribes find significantly greater support in the law than those asserted by the State of Wyoming.

It is true, as urged by the State, that the language of conveyance in the 1905 Agreement is extremely broad. Article I of the Agreement sets forth the conveyance in the following terms:

> ARTICLE I. The said Indians belonging on the Shoshone or Wind River Reservation, Wyoming, for the consideration hereinafter named, do hereby

> cede, grant, and relinquish to the United States, all right, title, and interest which they may have to all the lands embraced within the said reservation, except the lands within and bounded by the following described lines: Beginning in the midchannel of the Big Wind River at a point where said stream crosses the western boundary of the said reservation; thence in a southeasterly direction following the midchannel of the Big Wind River to its conjunction with the Little Wind or Big Popo-Agie River, near the northeast corner of township one south, range four east; thence up the mid-channel of the said Big Popo-Agie River in a southwesterly direction to the mouth of the North Fork of the said Big Popo-Agie River; thence up the mid-channel of said North Fork of the Big Popo-Agie River to its intersection with the southern boundary of the said Reservation, near the southwest corner of section twenty-one, township two south, range one west; thence due west along the said southern boundary of the said reservation to the southwest corner of the same; thence north along the western boundary of said Reservation to the place of beginning:... (Emphasis added.)

This act involved approximately 1,480,000 acres of Reservation land - nearly 65% of what remained after the two earlier cessions - and directed that those lands be disposed of pursuant to Article II of the Agreement. That Article provided that the United States would dispose of the land under a payment schedule set forth therein, and "to pay the said Indians the proceeds derived from the sales of said lands . . . the amounts so realized to be paid to and expended for said Indians in the manner hereinafter provided."

Although Congressman Frank Mondell of Wyoming, who sponsored the 1905 Act, had forecast proceeds from the sale of the ceded lands to total more than 1.8 million dollars, little more than a quarter of a million had been realized on the sale of just 128,986.56 acres as late as June 12, 1914. In 1915 the Secretary of the Interior temporarily postponed further sale of

the ceded lands, and during the period from 1915 through 1934 only a few transactions, involving a minimal number of acres of land within the area, were sold. On September 13, 1934, the Interior Department again temporarily withdrew from further disposition the remaining land ceded under the terms of the 1905 Act. Subsequently, under the terms of restoration orders approved by the Congress, all of the remaining lands ceded by the 1905 Act, but not disposed of under its terms, were restored to the Reservation.

Attorneys for the State of Wyoming contend that this transaction constituted a "disestablishment" of those lands ceded under the 1905 Act and that the disestablishment resulted in a severance of the 1868 priority date from the ceded lands.

I think not. The Tribes were not advised that the effect of the Agreement would be the destruction of any water rights flowing from the 1868 Treaty. Nor was it the intention of either the Tribes or of the negotiators for the United States that the Agreement have the effect of destroying existing water rights, unless title passed to a bona fide purchaser or valid homesteader according to law. It is basic Indian property law in this country that the extinguishment of Indian property rights must be clearly and plainly provided for by the Congress and will never be implied. Menominee Tribe v. United States, 391 U.S. 404, 412-13 (1968); United States v. Santa Fe Pacific Railroad Co., 314 U.S. 339, 353-55 (1941).

Further, "when Congress has once established a reservation all tracts included within it remain a part of the reservation until separated therefrom by Congress." U.S. v. Celestine, 215 U.S. 285, 54 L.Ed. 195 (1909). And the law is clear that such a Congressional determination "must be expressed on the face of the act or be clear from the surrounding

circumstances and legislative history." Mattz v. Arnett, 412 U.S. 481, 505, 37 L.Ed. 2d 92, 93 S.Ct 2245 (1973). When read it its entirety, and when considered in light of the circumstances surrounding the transaction, the 1905 Act seems more clearly to support the contention of the Tribes and the United States that the intent was that the Indians convey to the United States only the right to dispose of the ceded lands, i.e., to act as an agent with the power of attorney necessary to pass perfect title to a purchaser. I believe that Articles III, IX and X provide sufficient support for this conclusion.

The final sentence of Article III reads, in pertinent part, as follows:

> (T)hat upon the completion of the said fifty dollars per capita payment, any balance remaining in the said fund of eighty-five thousand dollars, shall at once become available and shall be devoted to surveying, platting, making of maps, payment of the fees, and the performance of such acts as are required by the statutes of the State of Wyoming in securing water rights from said State for the irrigation of such lands as shall remain the property of said Indians, whether located within the territory intended to be ceded by this agreement or within the diminished reserve. (Emphasis added.)

This language clearly demonstrates the intent of the parties to the Agreement that certain of the lands within the ceded portion, excepting those lands disposed of by the United States on behalf of the Tribes under the provisions of the Agreement, would remain the property of the Indians.

Additionally significant is Article IX of the Act, which spells out the residual obligations of the United States under the Agreement and concludes:

> It is understood that nothing in this agreement contained shall in any manner bind the United States to purchase any portion of the land herein described, except Sections sixteen and thirty-six or

> the equivalent in each township or to dispose of said lands except as provided herein, or to guarantee to find purchasers for said land or any portion thereof, it being the understanding that the United States shall act as trustee for said Indians to dispose of said lands and to expend for said Indians and pay over to them the proceeds received from the sale thereof only as received, as herein provided. (Emphasis added.)

It is clear that the intent of the Brunot Agreement (The Lander Purchase) and the First McLaughlin Agreement (The Thermopolis Purchase) was to effect a disestablishment and a complete severance of the subject lands from the Reservation and Indian ownership. And the aforementioned language of the 1905 Act just as clearly indicates that the intent of this Act was to establish a trust relationship, with the United States acting as the trustee for the sale of certain Indian lands to settlers. The language of the 1905 Act is similar to that of the Agreement at controversy in Ash Sheep Co. v. United States, 252 U.S. 159 (1920), wherein the U.S. Supreme Court found the existence of just such a trust relationship.

In Ash Sheep, the defendant company was indicted for violating a statute which prohibited the driving of cattle "to range and feed on any land belonging to any Indian or Indian Tribe." The lands upon which the cattle had been driven were within the Crow Indian Reservation and subject to the Act of April 27, 1904, which had ratified and amended an agreement with the Crow Tribe. The United States agreed, under the terms of this Act, just as it did with the Shoshones and Arapahoes in 1905, that it would dispose of the effected lands by permitting them to be entered upon by homesteaders and other settlers, and that it would act as trustee in collecting the proceeds realized by such entry for the Indians and applying them as provided by the Agreement.

The Company, relying on the words of the Crow agreement, under which the Indians were said to "hereby cede, grant and relinquish to the United States all right, title and interest" in the lands to be open to settlement, insisted that the Indian title to those lands was extinguished and the lands upon which the Company grazed its stock were public, not Indian lands. The Company argued:

> (A)ll of the Indian rights were extinguished. . . . The cession to the United States is unqualified and unconditional. The manner of the disposal of the land, practically, under all of the land laws of the United States, . . . would preclude the idea that the Indian Department should exercise jurisdiction over it. 252 U.S. 159, at 160.

The arguments made by Ash Sheep Co. in this case were remarkably similar to those offered by the State of Wyoming here and, just as the Supreme Court rejected them in that case, so do I in the one at bar. In the former, the Supreme Court stated:

> It is obvious that the relation thus established by the act between the Government and the Tribe of Indians was essentially that of trustee and beneficiary and that the agreement contained many features appropriate to a trust agreement to sell lands and devote the proceeds to the interests of the cestui que trust.
>
> * * * *
>
> Taking all of the provisions of the agreement together we cannot doubt that while the Indians by the Agreement release their possessory right to the Government, the owner of the fee, so that, as their trustee, it could make perfect title to purchasers, nevertheless, until sales should be made any benefits which might be derived from the use of the lands would belong to the beneficiaries and not to the trustee, and that they did not become 'Public lands' in the sense of being subject to sale, or other disposition, under the general lands laws.

> . . .They were subject to sale by the Government, to be sure, but in the manner and for the purposes provided for in the special agreement with the Indians, which was embodied in the Act of April 27, 1904.... 252 U.S. 159, at 166

The State of Wyoming responds to these arguments with the suggestion that the manner of administration of such lands is irrelevant. She argues that even though the ceded lands have remained property of the Tribes, they have been, nonetheless, disestablished from the 1868 Reservation and that as a result of this disestablishment the 1868 priority date has disappeared in the context of the ceded portion. During closing arguments on the issue the State of Wyoming said:

> The Tribes and the United States seemed to argue that because the Indians or the Tribes through the United States maintain some interest in the ceded lands, that means the boundaries of the Indian Reservation still encompass those ceded lands.
>
> (Transcripts of September 8, 1980, p. 50)

Conversely, the State of Wyoming seems to argue that even though lands which were ceded under the 1905 Agreement but never disposed of thereunder remained the property of the Indians, the fact that the Act provided for their cession and subjected them to disposition effected a severance of certain of the Indian rights on said lands, specifically their right to an 1868 priority date for water on those lands. I find no legal justification for this conclusion. Certainly the State has cited no case law to support this argument. There is in evidence copies of maps produced both by the State of Wyoming and the United States which show the Reservation in its so-called diminished form, i.e. consisting only of those lands not ceded under the terms of the 1905 Agreement. Those maps are of little assistance in determining the effect of the 1905 Act on the

lawfully recognized boundaries of the Reservation. They certainly indicate the perceptions of mapmakers as to those boundaries, and these maps form but a small portion of the many items of evidence and law considered in determining this issue. The State does rely, to some extent, on the opinion of the U.S. Supreme Court in Rosebud Sioux Tribe v. Kniep, 430 U.S. 584, 51 L.Ed. 2d 660, 97 S.Ct. 1361 (1977). However, at the outset of that opinion, Justice Rehnquist sets forth the following generally applicable rules of law in this area:

> In determining whether or not the 1889 Reservation boundaries were subsequently diminished by Congressional enactments, we are guided by well-established legal principles. The underlying premise is that congressional intent will control. DeCoteau v. District County Court, supra, 420 U.S. 425, at 444, 449, 43 L.Ed. 2d 300, 95 S.Ct. 1082; United States v. Celestine, 215 U.S. 278, 285, 54 L.Ed. 195, 30 S.Ct. 93 (1909); see also, Mattz v. Arnett, supra, 412 U.S. 481 at 505, 37 L.Ed. 2d 92, 93 S.Ct. 2245 (1973). The mere fact that a reservation has been open to settlement does not necessarily mean that the opened area has lost its reservation status. Mattz v. Arnettt, supra; see also Seymour v. Superintendent, 368 U.S. 351, 7 L.Ed. 2d 346, 82 S.Ct. 424 (1962). But the 'general rule' does not command a determination that reservation status survives in the face of congressionally manifested intent to the contrary. DeCoteau v. District County Court, supra. In all cases, 'the fact of the Act,' the 'surrounding circumstances,' and the 'legislative history,' are to be examined with an eye toward determining what congressional intent was. Mattz v. Arnett, supra, at 505, 37 L.Ed. 2d 92, 93 S.Ct. 2245. 51 L.Ed.2d 660, at 664-65. (Emphasis added.)

In applying these niceties of law to the facts in Rosebud, the Supreme Court concluded that "the Acts of 1904, 1907 and 1910 did clearly evidence Congressional intent to diminish the boundaries of the Rosebud Sioux Reservation." However, this

case - and its 1905 Act - differ substantially from the facts and circumstances involved in Rosebud. For example, in Rosebud the key word "convey" is used. It is absent in the "cede, grant and relinquish" language in the 1905 Act. I feel that Rosebud should not control the decision here.

To further support its position, the State of Wyoming cites State v. Moss, 471 P.2d 333 (1970); and Blackburn v. State, 357 P.2d 175 (1960), for the proposition that the Wyoming Supreme Court has recognized the disestablishment of the opened lands. But neither case is applicable to the question of priority dates on the undisposed lands. In Moss the trial court dismissed a first degree murder charge against the defendant for lack of jurisdiction, finding the crime was committeed on "Indian country" and, therefore, the United States had exclusive jurisdiction. However, the Wyoming Supreme Court reversed on the basis that the situs of the crime was ceded land transferred from Indian ownership. The land in question was allotment land which had been sold to a non-Indian and was, thusly, no longer a part of the Reservation.

The decision in Blackburn dealt with equally dissimilar lands. The situs of the crime was land whose Indian ownership was terminated by the Act of August 15, 1953, which Act compensated the Tribes for certain lands within the Riverton Reclamation Project. The State Supreme Court adopted this conclusion of the trial court:

> When the Indian title to these lands was fully and finally extinguished by the Act of August 15, 1953 aforesaid, jurisdiction, civil and criminal, over these lands passed from the United States to the State of Wyoming in all particulars, the same as any other lands within the public domain of the State of Wyoming. Blackburn, supra, at 178.

It seems to me that the conclusion the State asks is not only insupportable by law and by the circumstances of this case, but it would be a result on the short side of equity, and would fly in the face of Article X of the 1905 Agreement, which reads as follows:

> It is further understood that nothing in this agreement shall be construed to deprive the said Indians of the Shoshone or Wind River Reservation, Wyoming, of any benefits to which they are entitled under existing treaties or agreements, not inconsistent with the provisions of this agreement.

Under the Winters Doctrine, the Tribes are entitled to a priority date of 1868 for those lands reserved to them by the government. Nothing in the 1905 Agreement, nor the circumstances surrounding it, would lead one to conclude that the Indians or the U.S. intended that the water rights associated with the opened or ceded lands disappear as of the date of the Agreement. Certainly a retention of the 1868 priority date is a right to which the Indians were entitled under an existing treaty, and is a right which is not inconsistent with the provisions of the 1905 Agreement. I so find.

D. PRIORITY AND ALIENATION

The Boundaries and Dates foundation matter decided, there remains three issues, each of far-reaching importance to parties in this adjudication. They are:

Question 1: Upon the conveyance in fee of a parcel of land from an Indian allottee to a non-Indian, did a reserved water right pass to the non-Indian grantee? Or did it revert to the Tribes? Or was it lost by alienation?

Question 2: If the parcel is subsequently reacquired by the Tribes, what date governs for the establishment of a reserved right, the treaty date or the date of reacquisition?

Question 3: If the parcel is still in the ownership of non-Indians as of this adjudication, do they enjoy a reserved water right upon it by virtue of the conveyance from an Indian to their predecessors in title?

Before addressing each question, it is necessary to recognize that the ultimate answer to No. 3 may have to await further proceedings. This Report addresses Indian claims alone, and technically all parties whose rights are at stake in resolving Question No. 3 have not been heard from.[31]

1. The Initial Conveyance

In determining Question No. 1 - Alienability - the following cases were read and studied: The two Colville cases; the original opinion of the late Marshall Neill (C.J. 9th CCA), 460 F.Supp. 1320 (1978); the 9th Circuit opinion at 647 F.2d 42 (1981) which reversed the Neill opinion above; United States v. Powers, 316 U.S. 527 (1939); United States v. Anderson, supra.; United States v. Hibner, 27 F.2d 909 (1928); United

31. Mr. Sky D. Phifer, counsel to a group who assert a right stemming from Indian predecessors in title, has reserved time for a hearing concurrent with the preparation of this Report. On the other hand, a day of hearing (Tr. 156-157, pp. 14411, et seq.) was utilized by James Barrett and Michael Messenger, attorneys for the Merrill-Duncan-Webber group of defendants, whose rights, including determination of the status of the Hempleman decree, will be determined in a Supplemental Report to be issued following hearings on all remaining matters -- Forest, BLM, parks, and other matters not involving the Wind River Indian Reservation.

States v. Adair, supra.; United States v. Ahtanum Irrigation District, 236 F.2d 321 (1956).

None of the above was held to be determinative. Instead I re-read the briefs and proposed findings of all parties who submitted material on alienability. Much in these pleadings deals with interpretations of the two Colville decisions.[32]

I believe that Question No. 1 is properly answered by holding that the reserved right existing at the time of conveyance gives a non-Indian grantee no reserved right to water. The record in this case is replete with examples where land so conveyed was immediately listed in the jurisdiction of the Wyoming State Engineer with state water permits being issued thereon; and therefore became subject to Wyoming state water law. To completely answer Question No. 1, it is also inescapable to me that conveyance of an allotment parcel within the boundaries of the Reservation, and later reacquired by the Tribes, does not destroy the right for that land to be included in acreage determining reserved right quantities in a general

32. The positions of the parties in Colville were similar to the instant case, but facts were massively different. Walton and the state argued that since Winters rights are appurtenant to the Indian allotment, the rights are transferred at the time of the conveyance of the allotment to a non-Indian. (Thus directly contrary to Wyoming law as adjudged in Merrill v. Bishop, supra.) The Confederated Tribes, on the other hand, contend that Winters rights are Tribal rights and that Congress in the Allotment Act did not intend to divest Tribes of these rights; ergo, an allottee may only hold his proportionate share of the Tribal rights while holding the land, and may not alienate these water rights when he sells his land to a non-Indian. The United States asserts that the allottee may sell to a non-Indian a right to that portion of water which was being put to beneficial use at the time the allotment left trust status and that this transferrable water right would have a priority date as of the establishment of the Reservation.

stream adjudication of this kind and at this time. I believe the cut-off on this ruling to be the adjudication itself. It would be an injustice to extend this right to lands that may be re-acquired by the Tribes following the date of the Report herein. The purpose of this decree is to make a final determination of the quantification of water rights on the Reservation, not to set in motion machinery that could extend the uncertainties for another century.

The United States and Tribes oppose the latter part of this finding on Question No. 1, and argue that reserved rights continue to be available for fee lands as they are reacquired in trust for the Tribes.

The Tribes assert the following in support of its contention:

> While the lands are out of trust status in non-Indian ownership the level of Indian development on the reservation trust lands is necessarily lower. But the status of land titles on Indian reservations is dynamic; shifting congressional policies for example have made varying portions of Indian reservations available to non-Indians. Today the policy of the United States is to consolidate reservation land in trust for the benefit of Indians. F. Cohen, Handbook of Federal Indian Law (1982 ed.), pp. 612-15. The accident of time in which a stream adjudication occurs should not cause the court to overlook the fact that the reservation's title status is continuously evolving. Thus, the wisest position for the court to adopt regarding reserved rights is that so long as there is a reservation, there are reserved rights with a priority date as of the creation of the reservation. United States Brief in Support, p. 277. As the United States requested in its April 7 Brief, the decree in this case can be modified if necessary to accommodate, at a later date, the reserved rights associated with fee lands as they are reacquired in trust for the Tribes. (Emphasis added by Tribes)

I disagree with the above. For if it is acceptable, then mainstream adjudications or other hearings under the McCarren Amendment would become a nullity. The very purpose of this long and costly trial is to put an end to the uncertainty that exists for both Indians and non-Indians in Water Division No. 3. This cannot be achieved if there is to be a residual right in the Tribes to acquire long standing non-Indian inholdings, return them to Tribal status, and announce with a flourish an imposition of a 1868 date for water on such lands. I believe the following example proves my point.

Let us assume the Tribes purchase every acre of every ranch and farm now constituting the Riverton Reclamation Project. These are lands of the Reservation's "ceded" portion, thrown open to settlement in 1905 and in the main farmed continuously ever since. These lands operate under state awarded Permit 7300, with a 1905 priority date. Are we to assume that should they suddenly be owned by the Tribes, these 1905 water rights are no longer capable of providing a livelihood for Indians, even though they have for non-Indians these past 75 years? How can it be asserted that, "the purposes for which the Reservation was created" are not properly fulfilled by the acquisition of a 1905 reserved right stemming from long ceded lands with a 1905 state right which has sustained generations of farmers and ranchers in the area?

My argument is not to be interpreted as desiring to impose these state water rights upon the Tribes in the event of such an acquisition. Its point is to prove that a 1905 reserved water right date would be in order and fair, rather than a treaty date, which would be unequal and unfair, in the event of future acquisitions of this kind.

2. Reacquisition By Tribes

Question No. 2 is next answered. For reasons stated above, the treaty date of 1868 is hereby awarded to lands within original Reservation boundaries reacquired by the Tribes prior to the date of this Report. Following the date of this Report, the date to establish the reserved right is the date of the issuance of the first state awarded water permit on said after-acquired land, if uncancelled at the time of reacquisition.

This report is careful not to impose state water rights upon said parcels, and to adhere to Wyoming's Constitutional disclaimer of jurisdiction over said Indian lands. The measure of these efforts is to establish dates for reserved rights, not to impose state water rights or their statutory conditions upon Indians or their land.

3. Reacquisition By Non-Indian Entity

Question No. 3 will now be addressed subject to the Supplemental Report herein, for reasons mentioned above.

I hold that the conveyance of Reservation land to a non-Indian in fee does not include a treaty-date reserved water right for that specific land. For if it did, then it is proper to decree that non-Indians now in ownership of lands granted by Indians to predecessors in title should also retain the coveted 1868 date; and with this I cannot agree. To do so would be to undo long-settled Wyoming law on this point;[33] something that is not warranted by the evidence in this adjudication.

33. See Merrill v. Bishop, 74 Wyo. 298 (1955).

Cappaert aside, no showing has been made that the implied reserved right for water was ever intended to benefit any but Indians. The conclusion on Congressional intent (see, "Intents and Purposes", infra) supports the view that the Treaty of 1868 was to reserve a number of acres of land for the Tribes that would continue without marked change in status or area, as so often stated, for their permanent home. In this regard, Colville[34] reveals this excellent statement of judicial logic which was promptly reversed by the 9th Circuit Court:

> An analysis of the rationale for the reserved rights doctrine convinces this Court that the implied reservation of waters on Indian reservations should be limited to Indian ownership. Winters doctrine rights were reserved to members of the Indian tribe living on the reservation. Winters, supra, 207 U.S. at 576, 28 S.Ct. 207; Arizona v. California, 373 U.S. at 600, 83 S.Ct. 1468. Water was impliedly reserved to ensure that the lands intended to be permanent homelands for the Indians would have the necessary water to fulfill that purposes. Id. The Indians of the Northwest were not agrarian at the time they were forced onto reservations. The transition from the traditional nomadic life to an agrarian existence required the development of agricultural skills. Implied reserved water rights are open-ended so that as the Indians develop the necessary skills they are able to appropriate the water required to make the land productive. See Winters, supra. When title to Indian lands passes into non-Indian hands, the purposes for which the reserved water rights are implied no longer exist. It therefore seems logical to conclude that reserved water rights on Indian reservations are limited to Indians.
>
> The purpose of the reservation is to be determined from the intent of the creators at the time of the withdrawal from the public domain. Id. The reservation of water may be implied only where

34. Colville, 460 F.Supp., p. 1328.

such water is essential to preserve the purpose for which the reservation was created. No reservation of water may be implied for any use which is not based on one of the purposes for which that land was reserved. [United States v. New Mexico, 98 S.Ct. 3012, 57 L.Ed.2d 1052 (1978).] Applying these recent restricted concepts of reserved rights, it is clear that when the reserved purposes are terminated, as when a national park is returned to the public domain or when Indian property is sold to non-Indians, the reserved rights can no longer be judicially implied.

This Court therefore concludes that Winters reserved rights do not per se apply to allotments owned by non-Indians. This conclusion, however, does not foreclose possible availability of water to the non-Indian grantee.

In contrast, the following language from the Colville reversal may give hope to all defendants who own lands once conveyed by an Indian allottee. I have rejected this rationale because the evidence in this case is replete with examples of state water permits either being requested or granted immediately upon acquisition of these parcels by non-Indian owners. They did not look to the Indian grantor for water. I believe this distinguishes the Colville facts from the case at bar.

It is settled that Indian allottees have a right to use reserved water. United States v. Powers, 305 U.S. 527, 59 S.Ct. 344, 83 L.Ed. 330 (1939). '[W]hen allotments were made for exclusive use and thereafter conveyed in fee, the right to use some portion of tribal waters essential for cultivation passed to the owners.' Id. at 532, 59 S.Ct. at 346. We must determine whether non-Indian purchasers of allotted lands also obtain a right to some portion of reserved waters.

The general rule is that termination or diminution of Indian rights requires express legislation or a clear inference of Congressional intent gleaned from the surrounding circumstances and legislative history.

> See Bryan v. Itasca County, 426 U.S. 373, 392-93, 96 S.Ct. 2102, 2112-13, 48 L.Ed.2d 710 (1975); Mattz v. Arnett, 412 U.S. 481, 504-05, 93 S.Ct. 2245, 2257-58, 37 L.Ed.2d 92 (1972). Upon careful consideration, we conclude this principle supports the proposition that an Indian allottee may sell his right to reserved water.
>
> The district court's holding that an Indian allottee may convey only a right to the water he or she has actually appropriated with a priority date of actual appropriation reduces the value of the allottee's right to reserved water. We think this type of restriction on transferability is a 'diminution of Indian rights' that must be supported by a clear inference of Congressional intent.
>
> By placing allotted lands in trust for 25 years, Congress evinced an intent to protect Indians by preventing transfer of those lands. But there is no basis for an inference that some restrictions survived beyond the trust period. Congress provided for extensions of the trust period, but directed that fee title be conveyed to the allottee when the period expired. We think the fee included the appurtenant right to share in reserved waters, and see no basis for limiting the transferability of that right.
>
> This conclusion is supported by our decision in United States v. Ahtanum Irrigation District, 236 F.2d 321, 342 (9th Cir. 1956), cert. denied, 352 U.S. 988, 77 S.Ct. 386, 1 L.Ed.2d 367 (1957). Ahtanum held that non-Indian purchasers of allotted lands are entitled to 'participate ratably' with Indian allottees in the use of reserved water. Colville, supra, 42 at 50.

In this adjudication, there are many distinctions readily apparent from the facts of Colville. In that case, only one river was involved, the No Name, and it was located "entirely within the Reservation." The appellate court noted that the state's interest in extending its water law to the reservation

was limited; that tribal or federal control of No Name waters should have no impact on state water rights off the Reservation.[35]

In this adjudication, an entire river system, not just one stream, is involved. It is not entirely within Indian country, but headwaters near, and passes through the Reservation and continues to be the source of water for thousands of defendants living downstream in Water Division No. 3. Wyoming is not seeking to impose or extend its water law to the Reservation, but is maintaining certain positions regarding the selection of a reserved right date, and what qualifies as land deserving it.

And lastly, rather than having no impact of state water rights off the Reservation, in this case quantification of reserved rights will adversely affect virtually all of the balance of state awarded rights in the entire Division.

The above are some of the reasons I declined to follow the latter Colville holding. It is also worthy of note that few matters are as diffused as this subject in Western water law. The last footnote in the Colville Circuit Court of Appeals reversal implored the Supreme Court to pass upon and in finality reconcile these difficult and conflicting views. It read:

> We are persuaded of the correctness of our analysis and conclusion concerning the transferability of the water rights involved in this litigation. Nevertheless, we recognize that reasonable minds hold conflicting views. State and federal courts, state and federal agencies responsible in water rights administration, and the numerous Indian tribes, allottees and their transferees, are plagued almost on a daily basis with the problems and uncertainties surrounding the issues discussed in this opinion. This case presents an appropriate vehicle for the Supreme Court to give guidance and stability to an area of

35. See Colville, supra, p. 2639.

> great unrest and uncertainty in Western water and land law. A definitive resolution is overdue. The magnitude of the problem cannot be overstated.[36]

Whereupon the Supreme Court promptly declined review.[37]

In conclusion, I find that July 3, 1868 -- the date of the treaty between the United States and the Tribes -- is the priority date for reserved water rights on all practicably irrigable acres within either the diminished or ceded portion of the Wind River Indian Reservation. This treaty priority date will apply also to Indian fee or tribal lands within the aforesaid Reservation that were conveyed in fee to non-Indian ownership and reacquired, so long as said lands were reacquired by the Tribes prior to the date of this Report in this adjudication.

The 1868 treaty date will not apply to lands reacquired by the Tribes after the date of this Report, whether located in ceded or diminished portions of the Reservation, or anywhere else in Water Division No. 3. I find that this adjudication assists in fulfilling the purposes for which the Reservation was established, quantifies the water for its future generations, and terminates the need to assert a treaty date for water rights for any future acquisition of land by the Tribes of this Reservation.

The above treaty date will not apply in determining the water rights of non-Indian owners of parcels within or without the Reservation. This finding supports and sustains Wyoming

---

36. 647 F.2d 42 at 54.
37. Cert. Denied. No. 81-421, 70 L.Ed. 630 (Feb. 12, 1982). Justice Brennan and Justice White would have granted certiorari.

law,[38] affirming that non-Indians who purchased lands from Indians did not receive superior water rights stemming from the treaty.

Those Reservation lands conveyed under the terms of the Brunot Agreement and the First McLaughlin Agreement were conveyed absolutely from Indian ownership, and as such are not entitled to priority date based on the doctrine of reserved rights.

These Findings and Conclusions are included in the section entitled "Findings of Fact and Conclusions of Law", infra.

38. See Merrill v. Bishop, 74 Wyo. 298 (1955).

IV. INTENT AND PURPOSES

A. INTENT

The primal issue in adjudicating the right of the Wind River Indian Reservation to a federal reserve of water is whether any right exists at all. This requires a finding and conclusion that Congress, either explicitly or impliedly, intended to reserve water when it created the Wind River Indian Reservation. The respective positions of counsel for the State of Wyoming and the United States are diametrically opposed on this issue.

Counsel for the State of Wyoming contends Congress did not explicitly reserve any water nor did it intend to do so. Furthermore, evidence of certain acts of Congress and federal officials is presented to show that Congress consciously elected to deny a reserved right and deemed it more appropriate for the Indians to get their water by application to the State Engineer. Counsel argues that Winters does not apply to this reservation and that the history of Wyoming and the development of the Wind River Indian Reservation is unique and justifies a conclusion contrary to the holding in Winters. Finally, the nature and extent of detriment to non-Indians in the Big Horn River System presented during the hearings is submitted as further proof of a conflict of Congressional positions designed to show that Congress certainly could not have intended to grant a reservation as envisioned by the pleadings of the United States.

Counsel for the United States relies on the Winters decision, and subsequent United States Supreme Court case law derived from that decision, to maintain that the doctrine of an implied intent to reserve water for a reservation applies to the Wind River Indian Reservation. The Treaty of 1868, interpreted in light of the Winters precedent and compared to the facts in that case, is offered as the determinative authority for the position of the United States.

I have studied the relevant United States Supreme Court case law and have carefully examined the 1868 Treaty and how the language and history of that Treaty relates to the development of the reserved rights doctrine. I have analyzed the 348 "Intent and Purposes" exhibits offered by the State of Wyoming, along with the competent argument of counsel for the State of October 7, 1981,[39] supporting the position that no reservation of water exists. It is my conclusion that the Winters doctrine is applicable and that Congress, by the Treaty of 1868, impliedly created a reservation for water on the Wind River Indian Reservation to satisfy the purposes of that Treaty.

1. Fort Belknap Reservation

The agreement of May 1, 1888,[40] which created the Fort Belknap Reservation, was the subject of the United States Supreme Court landmark holding known as the Winters Doctrine.[41] In that decision, the Court affirmed the lower court decree granting the Indians an implied reservation of water by virtue of the 1888 treaty which created the reservation. The

39. Tr. p. 11285 et seq.
40. 25 Stat. at L. 113, Chapter 213.
41. Winters v. United States, 207 U.S. 564, 28 S.Ct. 207, 52 L.Ed. 340 (1908).

Court has considered the implied reservation question several times since, and has affirmed its position each time.[42] Furthermore, lower courts have consistently applied the doctrine in a variety of circumstances as controlling precedent.[43]

The Wyoming Supreme Court has also considered the Winters Doctrine and its specific application to the Wind River Reservation.[44] That case concerned an action to enjoin the State Engineer and other water officials from interferring with and closing the head gates of the plaintiffs, who owned land originally allotted to Indians. Justice Blume carefully developed his decision by applying the law only to the precise fact situation presented and specifically did not intend his opinion to be expansively interpreted:

> We shall not, however, in deciding this interesting and heretofore undecided question involved herein, go further than is necessary, and shall, as far as possible, leave undecided points on which the Supreme Court of the United States is the ultimate authority.[45]

He did, however, begin his analysis with the premise that Winters must be reckoned with.

---

42. United States v. New Mexico, 438 U.S. 696, 89 S.Ct. 3012, 57 L.Ed.2d 1052 (1978); Cappaert v. United States, 426 U.S. 128, 96 S.Ct. 2062, 48 L.Ed.2d 523 (1976); Arizona v. California, 373 U.S. 546, 83 S.Ct. 1468, 10 L.Ed.2d 542 (1963).
43. Colville Confederated Tribes v. Walton, 647 F.2d 42 (9th Cir., 1981); United States v. Adair, 478 F.Supp. 336 (D. Ore. 1979); United States v. Ahtanum Irrigation District, 236 F.2d 321 (9th Cir. 1956); Anderson v. Spear - Morgan, 79 P.2d 667 (Mont. 1938); United States v. Hibner, 27 F.2d 409 (D. Ida. 1928); Conrad Inv. Co. v. United States, 161 F. 829 (9th Cir., 1908).
44. Merrill v. Bishop, 287 P.2d 620 (Wyo. 1955).
45. Ibid., at p. 625.

> It must, of course, be admitted that according to the holding in Winters v. United States, supra, the water rights appurtenant to the Indian Reservation here in question were reserved to the Indians by the treaty of 1868.[46]

My conclusion on the question of Congressional intent does not disrupt the holding in Merrill v. Bishop. It answers a question presented by the referral which was not before the Wyoming Supreme Court in that case.

2. The Wind River Indian Reservation

The Treaty of 1868 between the Shoshone and Bannack Tribes and the United States, which created the Wind River Indian Reservation, is the crucial document in determining congressional intent.[47] Article II of the Treaty specifically provides that the reservation be "...set apart for the absolute and undisturbed use and occupation of the Shoshone Indians herein named, and for such other friendly tribes or individual Indians as from time to time they may be willing...to admit amongst them...." Article IV provides that the Indians "...will make said reservations their permanent home..." and Article VI anticipates that they will "...desire to commence farming...." I can find no significant difference between the intent of Congress exhibited by these passages and those passages from the Fort Belknap Treaty provisions ruled upon by the United States Supreme Court in Winters.[48] While it must be admitted that the respective treaty provisions are not identical, they are so similar that one may reasonably imply the same Congressional

46. Ibid., at p. 623.
47. Plaintiff's Exhibit WRIR I & P 1; U.S. Exhibit WR-1.
48. Winters, at p. 565.

intent from each treaty. Any other conclusion would appear to be contrived, and contrary to Supreme Court precedent.

The conclusion of implied Congressional intent is not refuted by the contention of the State of Wyoming that the Wyoming Act of Admission[49] is explicit proof of Congressional intent to the contrary. The State argues that Congress, in admitting Wyoming as a state in 1890, adopted and ratified the Constitution of Wyoming, including Article 8, Sections 1 and 3.[50] Those sections are as follows:

> 1. Water is state property.
>
> The water of all national streams, springs, lakes or other collections of still water, within the boundaries of the state, are hereby declared to be the property of the state.
>
> 3. Priority of appropriation.
>
> Priority of appropriation for beneficial uses shall give the better right. No appropriation shall be denied except when such denial is demanded by the public interests.

Consequently, the State contends, Congress explicitly acknowledged that all water in Wyoming is the property of Wyoming and therefore subject to appropriation only through the laws of Wyoming, and concludes that the ratification repeals any reservation of water created by the Treaty of 1868. The Supreme Court was presented with a similar argument in Winters and determined such an argument to be "elaborate and able" but without merit.[51] I believe the same conclusion is appropriate in this case.

I acknowledge and appreciate that the Constitutions of Wyoming and Montana are not identical in the sections relevant

49. Plaintiff's Exhibit WRIR I & P 11.
50. Plaintiff's Exhibit WRIR I & P 12.
51. Winters, at p. 578.

to this case nor are the fact situations surrounding the two reservations. However, the logic and analysis used by the Supreme Court in Winters applies equally well here. There is no direct, obvious provision in the Act of Admission which openly states that Congress is repealing any provision of the Treaty of 1868. To reach such a conclusion, one must imply that intent from the document. Such an implication would be ill-founded. Additionally, it is ironic that the argument of the State requires a rejection of an implied intent analysis when dealing with the Treaty of 1868 and yet requires the same implied intent analysis in considering the 1890 Act of Admission. Given the application of the Winters decision to the 1868 Treaty, I cannot see how one can reasonably conclude that an "elaborate", speculative interpretation of an act is sufficient to deprive the Indians of the water reserved to them by the Treaty of 1868, a reservation which, without water, "would be valueless".[52]

The remaining argument against a reservation of water is that there exists conflicting evidence on the Congressional intent question. Even if that were true, the Winters decision still requires a finding that intent existed. Mr. Justice McKenna recognized there may be a conflict of the implications which may be drawn from the various acts, but he concluded that when such a conflict exists, "...that which makes for the retention of the waters is of greater force than that which makes for their cession."[53]

Many of the exhibits introduced by the State of Wyoming during the "intents and purposes" portion of its case in chief were letters between certain officials, records of appropriation

52. Winters, at p. 576.
53. Ibid.

actions taken by Congress, and reports to Congress by various Indian agents. These documents were presented as proof of a conscious, deliberate attitude of Congress that if the Indians were to expect any water, they must rely on and comply with the system of appropriation established by state law.

First, this position directly contradicts the Winters holding. Second, it wholly lacks any chronological perspective surrounding the development of the Wind River Indian Reservation and fails to address the question of what was the Congressional intent in 1868, the date of the treaty. Third, it requires placing a greater weight on a miscellaneous group of letters and documents than on a treaty of the United States. The precedent is well established that ambiguities must be construed in favor of the Indians and that any termination or diminution of the Indians' rights can be done only by express legislation or a clear showing of intent from surrounding circumstances.[54] The State of Wyoming fails to prove such a clear intent. While lengthy, bulky, and large in number, the exhibits presented lack the qualitative content necessary to support the State's argument and to dispute my conclusion that the Indians are entitled to a reservation of water by the Treaty of 1868.

3. Equal Footing Doctrine

One contested issue of law included whether or not the Equal Footing Doctrine dictates that by admitting Wyoming into the Union on equal footing with the original thirteen states, the

54. Winters, at p. 577; Colville Confederate Tribes v. Walton, 647 F.2d 42, 50 (9th Cir., 1981).

Federal government did not intend to reserve water in the State of Wyoming.

This will be disposed of in short order.

In United States v. District Court in and for County of Eagle, Colorado, 401 U.S. 520, 91 S.Ct. 998, 28 L.Ed.2d 278 (1971), the Supreme Court said:

> It is clear from our cases that the United States often has reserved water rights based on withdrawals from the public domain. As we said in Arizona v. California, 373 U.S. 546, 83 S.Ct. 1468, 10 L.ED.2d 542, the Federal Government had the authority both before and after a State is admitted into the Union 'to reserve waters for the use and benefit of federally reserved lands.' Id., at 597, 83 S.Ct. at 1496. The federal reserved lands include any federal enclave. (Emphasis added)

In addition, the Equal Footing Doctrine does not command that all states must enter the Union equal in economic stature and property rights to the original thirteen. Again, the Supreme Court said, in United States v. Texas, 339 U.S. 707, 70 S.Ct. 918, 94 L.Ed. 1221 (1950):

> The 'equal footing' clause has long been held to refer to political rights and to sovereignty. See Stearns v. State of Minnesota, 179 U.S. 223, 245, 21 S.Ct. 73, 81, 45 L.Ed. 162. It does not, of course, include economic stature or standing. There has never been equality among the States in that sense. Some States when they entered the Union had within their boundaries tracts of land belonging to the Federal Government; others were sovereigns of their soil. Some had special agreements with the Federal Government governing property within their borders. See Stearns v. State of Minnesota, supra, 179 U.S. pages 243-245, 21 S.Ct. pages 80-81. Area, location, geology, and latitude have created great diversity in the economic aspects of the several States. The requirement of equal

footing was designed not to wipe out those diversities but to create parity as respects political standing and sovereignty. (Emphasis supplied)

Thus, while the State of Wyoming entered the Union on par with the original states as regards sovereignty, it cannot be argued that the United States was forced to transfer its ownership of the waters on all public lands to the state under the Equal Footing Doctrine. To do so expands the doctrine in a direction foreclosed by the clear statement of United States v. Texas, supra.

Mr. Michael D. White, as Master Referee in a recent Colorado adjudication, recognized that the Equal Footing Doctrine can have a direct effect on certain property rights where the property right is so identified with a sovereign power of government that it cannot be separated therefrom.[55] For example, this rule has generally been applied to uphold the transfer of ownership of the beds and shores of navigable streams from the United States to the states upon their admission to the Union. Mr. White made it clear in his Report that the rule cannot be extended to prohibit the establishment of Federal reserved rights, before or after statehood.

I concur, and find that the property interest Wyoming has in the ownership of her waters is not so identified with state sovereignty as to invoke the Equal Footing Doctrine.

B. PURPOSES

Once a determination is made that Congress did intend to reserve water for the Reservation by the Treaty of 1868, the

55. United States v. Oregon, 295 U.S. 1, 55 S.Ct. 610, 79 L.Ed. 1267 (1935); United States v. Texas, supra.

next question which must be answered is what Congress intended as the purposes for the use of that water. While the respective parties are not in complete disagreement on this issue, this particular question has been the subject of several pages of briefs submitted and fine distinctions and arguments drawn by all parties involved.

The United States maintains that the Reservation was established to provide a permanent home for the Indians. As such, the United States contends that any purpose which furthers the goal of establishing that permanent home is valid and should be included in quantifying the amount of water to which the Indians are entitled.[56] The proposed purposes include agriculture, livestock, fisheries and wildlife, mineral development, municipal and industrial uses, and aesthetics. It is finally argued that the water to satisfy the above purposes must be measured by keeping in mind not only the present but the future needs of the Reservation.

The State of Wyoming, while reserving its position that no reservation of water exists at all, maintains that if a reservation does exist, it exists only for the minimal amount of water necessary to prevent the purposes of the Reservation from being entirely defeated.[57] The State of Wyoming argues that the purpose of the 1868 Treaty and of the Government's intentions in entering into such a Treaty was to convert the Indians from a nomadic life to an agricultural one. As such, the State admits within the scope of this argument that the purposes of

---

56. Legal Parameters for United States' Statement of Claims, filed March 5, 1980, p. 6.

57. State of Wyoming's Response to the United States' Statement of Claims and to the Statement of the Shoshone and Arapahoe Tribes Concerning the Measurement of Tribal Reserved Water Rights, filed July 16, 1980, p. 11.

the Reservation are for domestic, agricultural and stock watering uses only.[58] The State of Wyoming specifically denies that the purpose of the Reservation was for a "permanent homeland."[59] It is argued that the "permanent homeland" language found in the Treaty of 1868 was included to set a time frame for the duration of the Reservation and was not intended by Congress as evidence of the principal purpose of the Reservation. The State concludes by asserting that it is not before me to decide whether Congress was right or wrong in creating a Reservation with the purpose of converting the Indian way of life from a nomadic to an agrarian one, but rather to determine that such an intent was, in fact, the purpose of Congress in ratifying the Treaty of 1868.

Counsel for the Shoshone and Arapahoe Tribes begin with a basic premise which agrees with the argument of the United States, but seeks to have those purposes applied in a somewhat different manner. The Tribes also contend that the purpose of the Reservation is to provide a permanent homeland for the Tribes and, in so doing, provide sufficient water for the Indians' use in deriving a maximum benefit from all of the assets of that homeland.[60] The Tribes conclude that when applying the purposes to a quantification of the water, those purposes must be broadly interpreted so as to permanently pro-

58. State of Wyoming's Response to the United States' Statement of Claims and to the Statement of the Shoshone and Arapahoe Tribes Concerning the Measurement of Tribal Reserved Water Rights, filed July 16, 1980, p. 12.

59. Wyoming's Brief in Support of Its Response to the Claims for Water Rights of the United States and the Shoshone and Arapahoe Tribes, filed July 16, 1980, p. 36.

60. Pre-Trial Brief of the Shoshone and Arapahoe Tribes with Respect to Purposes and Legal Standards for Measurement of the Tribes' Reserved Water Rights, filed April 7, 1980, p. 6.

vide for the needs of the Reservation, envisioning a determination of future as well as present needs.

As in the discussion of Congressional intent, it is equally important here to rely on the Treaty of 1868 and relevant United States Supreme Court case law which has interpreted either that specific Treaty or treaties with other western Indians during the relatively same time period in our history. By doing so, and by applying that relevant case law to our situation, it is my conclusion that the principal purpose of the United States in entering into the Treaty of 1868 was to provide a permanent homeland for the Indians so that they may, in whatever way most suitable to their development, establish a permanent civilization on the Wind River Indian Reservation. To accomplish that purpose, the reservation of the use of water must include that water necessary to provide for the Indians not only in their agricultural development, but also in the raising of livestock, the assurance that fish and wildlife will also be available for their use, the development of the minerals that may be found on the Reservation, the growth and provision for municipal and industrial civilization, and for protection and preservation of the aesthetic natural conditions found on the Reservation.

The Treaty of 1868 contains several provisions, the reasonable interpretation of which can only lead one to conclude that the purpose of the Treaty was to provide a permanent homeland for the Indians. Article II of the Treaty states that the Reservation "shall be, and the same is set apart for, the absolute and undisturbed use and occupation of the Shoshone Indians herein named...."[61] Article IV refers to the Reserva-

61. Plaintiff's Exhibit WRIR I & P 1, United States Exhibit WR-1.

tion as the "permanent home" of the Indians and Article VII refers to the desire of the United States to "insure the civilization of the tribes entering into this Treaty". In order to insure this goal, the other provisions of the Treaty provide that the United States will provide an agent, a physician, teachers, other trained personnel, and will provide the facilities necessary for educating the Indians.

Analyzing the Treaty in its entirety, with specific reference to the above cited provisions, it is not at all unreasonable to conclude that the principal purpose for entering into this Treaty was to provide the Indians with a homeland where they could establish a permanent place to live and to develop their civilization just as any other nation throughout history has been able to develop its civilization. Agriculture has historically held an early position in the chronology of events of development. That does not mean that it must be the only means of civilization or the end of the development of a given civilization. The United States itself is rich in a history of development which had its beginnings with agriculture. It is from that agricultural beginning that a civilization can grow and develop and to maintain that the Indians must be limited to only an agricultural way of life is to narrowly and unreasonably limit the terms of the Treaty entered into by a Congress and a nation whose own history surpassed the narrow parameters of a solely agricultural civilization.

Relevant Supreme Court case law not only supports the above conclusion, but dictates such a conclusion. The Winters decision sheds little light on the discussion of purposes, but it does provide a meaningful basis from which one can begin to analyze the question. The court in that case set down the rule and established the beginning of a line of authority which main-

tains that when examining an Indian treaty and determining the basis and reasons for the terms provided in the treaty, one must always give benefit to an interpretation in favor of the Indians, to resolve ambiguities in favor of the Indians, and, whenever possible, to interpret provisions in an expansive rather than a limited manner.[62] The Shoshone Tribe case provides an excellent precedent by which to discuss the question of purpose, for in that case the United States Supreme Court directly considered the Treaty of 1868.

The Shoshone Tribe case was the result of an action brought by the Shoshone Tribe to recover the value of part of its Reservation taken by the United States when the Arapahoe Indians were placed on that Reservation. The Tribe contended, and the Court of Claims concluded, that in determining the amount of compensation, value should be given to the timber and mineral resources within the Reservation. The ultimate question for the Supreme Court to determine on appeal was whether the Treaty of 1868 had intended, as part of its purpose, to transfer ownership of, and therefore the value relating to, the timber and any mineral resources found within the boundaries of the Reservation. The court ruled that the Shoshone Tribe was entitled to any value attributable to the timber and minerals with the Reservation and that such was part of the purpose of the Reservation. In reaching this conclusion, the court extensively discussed the principal purpose of the Reservation and through this discussion shed some very valuable light on the question involved here.

---

62. Winters, at pp. 76-77; Arizona v. California, supra.; United States v. Shoshone Tribe, 304 U.S. 111, 82 L.Ed. 1213 (1938).

After enumerating the provisions of the Articles of the Treaty stated above, the court then considered the history of the development of the Reservation.

> "Upon consummation of the Treaty, the tribe went, and has since remained, upon the reservation. It was known to contain valuable mineral deposits - gold, oil, coal and gypsum. It included more than 400,000 acres of timber, extensive well-grassed bench lands and fertile river valleys conveniently irrigable. It was well protected by mountain ranges and a divide, and was the choicest and best-watered portion of Wyoming."[63]

In considering the question before it, the Supreme Court was required of necessity to examine the Treaty and discuss the reasons and purposes for the United States entering into the Treaty. In beginning such a deliberation, the Supreme Court once again reiterated the relative positions of the United States and the Tribes and that the need existed to interpret those provisions keeping the welfare and benefit of the Indians in mind.

> "They [treaties between the United States and Indians] are not to be interpreted narrowly, as sometimes maybe writings expressed in words of art employed by conveyancers, but are to be construed in the sense in which naturally the Indians would understand them."

With that understanding, the Supreme Court held that the principal purpose of the Treaty was:

> "...that the Shoshones should have, and permanently dwell in, the defined district of country. To that end, the United States granted and assured to the Tribe peaceable and unqualified possession in perpetuity. Minerals and standing timber are constituent elements of the land itself."[64]

---

63. United States v. Shoshone Tribe, supra., at p. 114.
64. United States v. Shoshone Tribe, supra., at p. 116.

Obviously, the Shoshone Tribe case did not concern water rights appurtenant to the Reservation and therefore cannot be considered dispositive of this issue. Nevertheless, the Court was very forceful and direct in its discussion of the Treaty and very clearly indicated its position concerning the extent and nature of the purpose of the Treaty. Applying the thrust of the Court's argument to the facts involved here, I conclude that Wyoming's proposed interpretation of the Treaty's purpose is far too restrictive and an unrealistic appraisal of the facts and situation existing at the date of the Treaty, and of the purpose for which Congress entered into the Treaty.

A reliance on Shoshone Tribe case does not require of necessity a conclusion that only the purposes discussed in that case are applicable here. The parameter of that decision was to determine whether the purpose of the Reservation included the granting of timber and mineral resources to the Indians, and not to determine the complete context of the purpose of the Treaty. Therefore, it is wholly consistent to maintain that the nature of the purpose determined above is supported by the philosophy and discussion of the Shoshone Tribe decision.

V. WIND RIVER INDIAN RESERVATION CLAIMS FOR WATER

A. AS ADVANCED BY THE UNITED STATES

On March 6, 1980, the United States filed its Statement of Claims on behalf of the Tribes. It listed an annual diversion requirement of over 640,000 acre feet of water, all but approximately 10,000 acre feet of which was claimed under Winters or reserved right priority date of July 3, 1868, and the 10,000 acre feet a reserved right corresponding to the priority dates of State permits and certificates issued to the Tribes by the State of Wyoming.

The original Federal Statement carried these claims in the following catagories, locations, and amounts:

ASSESSED NEEDS:

Irrigation	Practicably Irrigable Acres[65]	Acre-Feet[66]
Wind River		
Historic	11,230[67]	51,892
Future	62,606	221,520
Subtotal	73,836	273,412
Dinwoody Creek		
Historic	5,042	25,140
Future	752	3,760
Subtotal	5,794	28,900

65. These figures represent only land held in trust by the United States for the Indians of the Wind River Indian Reservation.
66. These figures represent diversion requirement.
67. Feasibility studies have not as yet been completed on 1,018 of these acres.

Little Wind River		
Historic	27,407[68]	122,793
Future	19,619	60,702
Subtotal	47,026	183,495
Popo Agie River		
Historic	2,020	9,090
Future	4,963	20,084
Subtotal	6,983	29,174
Owl Creek		
Historic	0	0
Future	615	1,962
Subtotal	615	1,962
Red Canyon Creek		
Historic	268	1,072
Future	0	0
Subtotal	268	1,072
Mud Creek		
Historic	553	2,212
Future	0	0
Subtotal	553	2,212
Bull Lake Creek	29	116
North Fork Wind Creek	56	224
Crow Creek	1,200	4,800*
Dry Creek	2,579	10,316*
Meadow Creek	194	776*
Willow Creek	185	740*
Big Dry (Pasup) Creek	743	2,972*
Five Mile Creek	418	1,672*
Muddy Creek	3,680	14,720*
Cottonwood Creek	603	2,412*
Surrell Creek	27	108*
Sage Creek	2,005	8,020*
Crooked-Trout	692	3,014*
Mill Creek	43	187*
	147,534	570,304
TOTAL IRRIGATION:		570,304 a.f.

*See footnote 69.

68. Feasibility studies had not as yet been completed on 18,595 of these acres.

69. Historic water requirements consume the direct flow hydrologic potential of these creeks. Therefore, a claim is made for the noted water requirement or all of the direct flow of the creek, whichever controls.

Livestock Industry[70]	Acre-Feet	
Wind River		
Historic	812	
Future	401	
Subtotal	1,213	
Little Wind River		
Historic	326	
Future	160	
Subtotal	486	
Popo Agie River		
Historic	91	
Future	48	
Subtotal	139	
Bighorn River(Owl Creek and Red Canyon Creek)		
Historic	625	
Future	310	
Subtotal	935	
TOTAL LIVESTOCK INDUSTRY:		2,773 a.f.
Municipal, Domestic and Commercial[71]		
Wind River		
Historic	455	
Future	590	
Subtotal	1,045	
Little Wind River		
Historic	450	
Future	590	
Subtotal	1,040	
Popo Agie River		
Historic	45	
Future	60	
Subtotal	105	
Groundwater (Wind River Formation)		
Historic	705	
Future	915	
Subtotal	1,620	
TOTAL MUNICIPAL, DOMESTIC AND COMMERCIAL:		3,810 a.f.

70. This includes the water needed to develop only trust assets held by the United States.

71. This includes the water needed to develop only trust assets held by the United States.

Sufficient groundwater to maintain the surface condition and the well levels of the Wind River Indian Reservation in their naturally occurring state.

Oil Development**		
Wind River		
Historic	1,694	
Future	306	
Subtotal	2,000	
TOTAL OIL DEVELOPMENT:		2,000 a.f.
Coal Development**		
Wind River		
Historic	0	
Future	3,450	
Subtotal	3,450	
Groundwater (Wind River Formation)		
Historic	0	
Future	900	
Subtotal	900	
TOTAL COAL DEVELOPMENT:		4,350 a.f.
Gas Development**		
Groundwater (Wind River Formation)		
Historic	135	
Future	631	
Subtotal	766	
TOTAL GAS DEVELOPMENT:		766 a.f.
Uranium Development**		
Wind River		
Historic	0	
Future	450	
Subtotal	450	
Groundwater (Wind River Formation)		
Historic	0	
Future	10	
Subtotal	10	
TOTAL URANIUM DEVELOPMENT:		460 a.f.

Phosphate Rock Development**		
Little Wind River		
Historic	0	
Future	318	
Subtotal	318	
TOTAL PHOSPHATE ROCK DEVELOPMENT:		318 a.f.
Gypsum Development**		
Groundwater (Park City Formation)		
Historic	0	
Future	325	
Subtotal	325	
TOTAL GYPSUM DEVELOPMENT:		325 a.f.
TOTAL DIVERSION REQUIREMENT:		585,106 a.f.

**See footnote 72.

Reservoir Maintenance

The water to maintain the level of Washakie Reservoir at its total capacity of 7,940 acre-feet.

The water to maintain the level of Ray Lake at its total capacity of 7,140 acre-feet.

NON-CONSUMPTIVE RESERVED RIGHTS

Fisheries[73]		Cubic Feet Per Second
Wind River		
- Above Dinwoody Creek	Annually	5,005.0
- Between Dinwoody and Bull Lake Creek	Annually	4,608.0

72. This includes the water needed to develop only trust assets held by the United States.

73. Water for this need is in the nature of an instream flow for reservation needs. In the event actual diversion reaches a level which would adversely impact upon the flows for fisheries, the right to develop storage to satisfy both needs is claimed.

- Between Bull Lake and Diversion Dam	Annually	5,867.0
- Between Diversion Dam and LeClair Canal	Annually	3,972.0
- Between LeClair Canal and confluence with Little Wind River	Annually	3,972.0
- Below confluence with Little Wind River	Annually	3,972.0
- Wind River Canyon	Annually	4,380.0
- East Fork	Annually	1,049.0
Bull Lake Creek		
- Below Bull Lake	Annually	1,848.0
- Above Bull Lake	Annually	660.0
Little Wind River		
- North Fork	Annually	615.0
- South Fork (below Washakie Reservoir)	Annually	683.0
- Above Popo Agie River confluence	Annually	790.0
Popo Agie River		
- Below North and Middle Forks	Annually	1,210.0
- North Fork (Below North Fork Canyon)	Annually	538.0
Dinwoody Creek		
- Before Dinwoody Lakes	Annually	672.0
Crow Creek		
- Above Crow Creek Canyon	Annually	96.5

ARAPAHOE RANCH

ACQUISITION DATES:[74] April 10, 1941
August 25, 1941
July 14, 1948

PURPOSE: Provide a permanent home for and civilization of the Tribes.

74. See United States' Statement of Geographic Boundaries, pp. 2-3, for legal descriptions of land acquired.

ASSESSED NEEDS:

Irrigation	Practicably Irrigable Acres	Acre-Feet
Owl Creek		
Historic	2,512	10,048
Future	0	0
Subtotal	2,512	10,048
TOTAL IRRIGATION:		10,048 a.f.

The irrigation needs of this portion of the Owl Creek Drainage are satisfied by the following state-recognized water rights acquired with the land. The United States' claims the right to use the water represented by the following certificate and permit numbers as of the priority dates listed.

Priority Date	Permit Number	Cubic Feet Per Second
Oct. 1, 1884	Terr.	5.39
June 1, 1887	Terr.	11.46
Oct. 4, 1889	2036	1.82
July 11, 1902	4038	6.84
Aug. 22, 1907	8125	4.74
May 8, 1909	9050	2.23
June 1, 1909	2058E	2.21
June 10, 1909	2059E	1.56
Sept 17, 1909	9346	2.52
Sept. 17, 1909	2125E	4.72
Oct. 26, 1909	2368E	25.00
Aug. 19, 1908	8721	6.63
May 15, 1909	9058	0.45
Sept. 12, 1910	10126	9.23
Sept. 24, 1906	7426	0.24
May 16, 1912	11707	0.91
June 20, 1904	6221	1.11

Far and away the largest encompassed use is irrigation and smaller percentages are devoted to mineral development (industrial), aesthetics, livestock, domestic use, municipal and commercial uses, reservoir maintenance, and instream flows of named tributaries to the Big Horn River, Greybull River,

Nowood River, Popo Agie River, Shoshone River, Wind River and Yellowstone River for fish maintenance and wildlife habitat.

The claims above totalled 580,752 acre feet of water diverted annually to serve 147,041 acres of irrigated, or practicably irrigable, land. Of this, 272,724 acre feet was to serve the 61,486 acres claimed to be under historic irrigation, including some idle acres and acres within project lands on the Reservation, and the remaining 308,028 acre feet of annual diversion for a proposed 85,555 acres of future projects. The United States' acreage claim for new or "future" projects was subsequently reduced to 53,760 as the result of Federal witnesses' testimony.

The lesser requests included about 5,000 acre feet annually for livestock use, 7,620 acre feet for domestic, municipal and commercial use for the year 2020, 8,019 acre feet annually for both historic and mineral development; and volumes of flow for non-consumptive instream purpose. The United States reserved the right, in the event actual diversion reaches a level adversely affecting fisheries, to develop storage to satisfy both needs.

The United States claimed the entire flow of the following 64 streams for aesthetic and wildlife purposes. Virtually all are located in the two Aesthetic "Belt" areas.

Stream	Source
Springs	Tributary Dry Muddy or Cottonwood Creek
Four Mile Springs	Tributary Dry Muddy
Two Mile Springs	Tributary Dry Muddy or Cottonwood Creek
Morrison Spring	Tributary Dry Muddy or Cottonwood Creek
Springs	Tributary Mexican Creek-tributary Dry Muddy or Cottonwood Creek

Ingalls Springs	Tributary Dry Muddy or Cottonwood Creek
Red Springs	Tributary Big Horn River
Stanger Creek	Tributary Dry Muddy or Cottonwood Creek
Sheep Creek	Tributary Muddy Creek
West Fork Sheep Creek	Tributary Muddy Creek
East Fork	Tributary Muddy Creek
O'Shea Springs	Tributary East Fork Sheep Creek
Edmore Creek	Tributary Sheep Creek
Springs Creek	Tributary Edmore Creek
Shotgun Creek	Tributary Muddy Creek
Alkali Springs	Tributary Shotgun Creek
Flood Gulch or Draw	Tributary Shotgun Creek
Willow Creek	Tributary Muddy Creek
Round-up or Warm-springs Creek	Tributary Willow Creek
Holland Creek	Tributary Warm Springs Creek
Muddy Spring	Tributary Holland Creek
Deep Springs Creek	Tributary Holland Creek
Spring	Tributary Muddy Creek
Dry Muddy Creek	Tributary Muddy Creek
Red Creek	Tributary Dry Creek
Meadow Creek	Tributary Big Wind River
South Fork Meadow Creek	Tributary Meadow Creek
Bobs Creek	Tributary Meadow Creek
Spring Gulch	Tributary Crow Creek
Dry Creek	Tributary Big Wind River
Dinwoody Creek	Tributary Dinwoody Creek
Red Creek	Tributary Big Wind River
Springs	Tributary Meadow Creek
Draw	Tributary Meadow Creek
Pine Creek	Tributary Willow Creek-Tributary East Fork North Fork Big Wind River
Spring	Tributary Trout Creek
South Fork Sage Creek	Tributary Sage Creek
St. Clair Creek	Tributary South Fork Sage Creek
St. Lawrence Creek	Tributary Sage Creek
North Fork Sage Creek	Tributary Sage Creek

Little Dry Creek	Tributary Dry Creek
Springs	Tributary Owl Creek
Mud Creek	Tributary Owl Creek
Middle Fork Mud Creek	Tributary Owl Creek
Hielschers Fork of Middle Fork Mud Creek	Tributary Owl Creek
Spring Draw	Tributary Mud Creek
Springs	Tributary Mud Creek
North Fork Mud Creek	Tributary Mud Creek
South Fork Mud Creek	Tributary Mud Creek
Spring	Tributary Owl Creek
South Fork Owl Creek	Tributary Owl Creek
South Fork Owl Creek and Springs	Tributary Owl Creek
Shoop Spring	Tributary South Fork Owl Creek
Red Creek	Tributary South Fork Owl Creek
Spring No. 1	Tributary Red Creek
Spring No. 2	Tributary Red Creek
Spring No. 3	Tributary Red Creek
Spring No. 4	Tributary Red Creek
Spring No. 5	Tributary Red Creek
Rock Spring Creek	Tributary Red Creek
Dry Cottonwood Creek	Tributary Red Creek
Spring	Tributary Red Canyon Creek
Pevah Creek	Tributary South Fork Sage Creek

The Statement further asked for water to maintain levels of all lakes within the Wind River Indian Reservation in their natural state, except Bull Lake, Ocean Lake, Boysen Reservoir, Ray Lake, Washakie Reservoir, and Pilot Butte Reservoir. Water to maintain the levels of Washakie at its total capacity of over 7,000 acre feet, and Ray Lake at its total capacity of 7,140 acre feet were a part of this section of the claim.

B. AS ADVANCED BY THE TRIBES

On April 7, 1980, in their own behalf, the Tribes filed their Statement Concerning the Measurement of Tribal Reserved Water Rights, intended as supplemental to the above claims in their behalf issued by the United States. It added to the United States claim an additional 931,348 acre feet of water per year, bringing the total request for Indian reserved rights water to more than 1,500,000 acre feet per year, or roughly five times the water being diverted for historical irrigation and all other uses prior to this action for an adjudication. They are based as follows:

The Tribes first contention is that the water duty on claimed acreage should be increased to the same standard based on Wyoming law and used throughout Wyoming by the State Engineer's office, that is, 4.24 acre feet of water per acre per year, which equates to the one cubic foot per second for each 70 acres set forth in the Statutes.[66] The volumetric claim of the United States on behalf of the Tribes divided by the total acreage claimed results in a water duty of 3.87 acre feet per acre per year, compared to the statutory 4.24 acre feet requested above. Thus, allowing this one Tribal contention would increase the annual diversion requirements by more than 55,000 acre feet per year.

The Tribes next claimed that Class V or subirrigated lands should be awarded full service irrigation. Assuming the Federal claim for partial irrigation of these same lands was based upon a one acre foot per acre per year standard for said lands, and applying the State standard of 4.24, the resulting

75. W.S. 41-4-317.

increase would account for an additional 15,627 acre feet per year.

The Tribes then advanced a claim which the United States had not addressed; for water to irrigate lands owned in fee by individual Indians. This initial claim was for 9,657 acres of land at 4.24 acre feet of water per year, for an additional 40,945 acre feet per year. Paralleling this claim was an assertion that future Tribal reacquisitions should have reserved right water totalling 140,191 acre feet of water per year. This is based upon the hypothesis of Tribal reacquisition of all fee land in the Federal Irrigation Projects, Riverton Valley and LeClair projects at some time in the future, a total of 33,064 acres. Again, the State standard water duty unit was applied.

Next, the Tribes claimed an additional cultivable land base of 422,500 acres, to which they applied the State standard to compute an annual diversion requirement of 560,040 acre feet, and a 702 acre tract within the Riverton Reclamation Withdrawal Area at the State standard, for an additional 2,976 acre feet annually. This claim had not been addressed in the Statement of the United States.

The Tribes quantified their claim for evapotranspiration from reservoirs and requested 85,350 acre feet per year for said loss.

Additional municipal and industrial requests added another 31,000 acre feet annually, and 1,000 acre feet annually more than the United States claimed was included for prospective growth within the communities and for the lagooning of municipal waste waters.

The Tribes then claimed sufficient groundwater to maintain current levels in all acquifers, and to prevent mining of that groundwater by others, no matter where located, to sus-

tain existing well production by them and their permittees, and to provide groundwater resources for future needs of the Reservation. No quantification was made for these purposes.

Excluding the groundwater claims, these additional requests at the time of the filing brought the initial total claim for reserved right water on the Wind River Indian Reservation to a total of 1,583,071.5 acre feet of water annually.

It is appropriate at this time to observe that during the long trial oftentimes admissions were made reducing certain claims. Supplemental pleadings were filed to reduce some totals, and following the submission of briefs and some of the rulings made without objections during trial, these totals were reduced by over 780,000 acre feet a year.

At the conclusion of the trial, the United States' final claim for irrigation had been re-adjusted at 367,426 acre feet annually to serve just under 60,000 acres of asserted historic lands, and just over 215,000 acre feet to serve 55,221 acres of future projects; in sum, a claim that 115,221 acres be found practicably irrigable, requiring an annual diversion of 582,414 acre feet of water.

The claim for aesthetics and wildlife purposes was reduced by the deletion of the following streams:

Stream	Source
South Fork Owl Creek	Tributary Owl Creek
South Fork Owl Creek and Springs	Tributary Owl Creek
Shoop Spring	Tributary South Fork Owl Creek
Red Creek	Tributary South Fork Owl Creek
Spring No. 1	Tributary Red Creek
Spring No. 2	Tributary Red Creek
Spring No. 3	Tributary Red Creek
Spring No. 4	Tributary Red Creek
Spring No. 5	Tributary Red Creek

Rock Spring Creek	Tributary Red Creek
Dry Cottonwood Creek	Tributary Red Creek
Spring	Tributary Red Canyon Creek
Pevah Creek	Tributary South Fork
	Sage Creek

Except for the three items mentioned in the next paragraph, the final claim of the Tribes, at the close of evidence, for the most part concurred with that of the United States. Each had been reduced substantially. There had been an understanding of agreement in many instances except in the irrigation usage; and the unquantified claims for groundwater, with the right to mine groundwater, of course, at issue.

In the area of water claimed for irrigation, the Tribes asserted three additional concepts, none of which had been maintained by the United States. The first was for 10,374 acres of land calling for an annual diversion of 46,724 acre feet on behalf of individual Indians holding their land in fee. Next were two of the future projects which the United States had deleted from their requests because of what they concluded were adverse economic considerations. They were the Big Horn Flats Extension, just over 9,000 acres of land calling for over 22,000 acre feet of water per year (which constituted the most economic and efficient water duty of any project, historic or future, on the entire Reservation), and an area of 897 acres on Stagner Ridge, requiring a diversion of 2,810 acre feet of water per year.

The Tribes continued to assert their request for 20% of the total Federal and Tribal claim for contingencies of land to be reacquired by the Tribes in the future; and a 20% increase in water to be used for municipal and domestic, and livestock, increasing to totals slightly larger than those on which the parties had agreed.

At the close of evidence, the exact quantifiable claims of the United States were as follows:

Use	Practicably Irrigable Acres	Annual Diversion Requirements in Acre Feet
Irrigation (Historic)	71,619	420,642
Irrigation (Future Projects)	55,221	215,882
TOTALS	126,840	636,524

	Acre feet per year
Livestock from surface and shallow wells	2,730
Industrial from deep acquifers	25,766
Municipal, Domestic and Light Commercial from surface and groundwater	2,371

The Indian claims paralleled the above except for the three additional requests mentioned just before the above tabulation.

There follows next my evaluation of the mounds of charts, graphs, maps, overlays, photos, brochures, tabulations, in evidence, and thousands of pages of testimony from which are adduced Findings of Fact and Conclusions of Law set forth in the sections, and near the end of the Report.

Part Two of this Report begins with this evaluation on existing Federal Irrigation Projects, and other parcels of land advanced as land "historically" irrigated. The evaluation regarding new or virgin turf that qualifies as practicably irrigable acreage follows thereafter in a section entitled "The Determination of Practicably Irrigable Acres on the Reservation's Future Lands", and the two Tribal claims then complete Part Two in a section entitled "The Determination of Practicably Irrigable Acres on the Reservation's Additional Tribes' Futures".

PART TWO

PART TWO

I. THE DETERMINATION OF PRACTICABLY IRRIGABLE ACRES ON THE RESERVATION'S HISTORIC ACRES

A. INTRODUCTION

The claims of the United States and Tribes for water on the Wind River Indian Reservation to irrigate land fall basically into two categories: water for lands now and historically irrigated, called the "Historic" acreage, and waters for lands not now irrigated but which would qualify now or in the future as practicably irrigable acres, called the "Future" acreage.

Historic use of water for irrigation includes waters for trust land unadjudicated but currently in use, adjudicated trust lands,[1] lands previously irrigated but currently idle,[2] lands not in use but irrigable from existing canals,[3] and Indian fee lands.

By category, acreage and water claims for said historically irrigated lands were as follows:

---

1. In this report, the term "adjudicated" means a parcel of land defined as one on which an uncancelled state awarded permit or adjudicated water right is in existence.
2. Type VII lands.
3. Type VIII lands, also refered to as undeveloped arable lands within the Wind River Federal Irrigation Projects (FIP's).

Historic Lands Category	Acres Claimed	Annual Diversion Requirement (acre-feet)
Adjudicated	17,411	97,404
Unadjudicated In-use	34,427	222,915
Type VII	7,946	47,107
Type VIII	1,461	6,512
Indian Fee	10,374	46,704
TOTAL CLAIM, Historic Lands	71,619	420,642

Total historic acreage claimed by the Tribes was never less than the above. In contrast, testimony produced by the State of Wyoming would level in the area of 4,261.67 acres[4] as practicably irrigable. This polar difference in acreage is consistent with the State's general position, as stated in its Response to Statement of Claims and brought out systematically in the opinions of its experts. That position, some of which I found to be persuasive, is generally that not all historically irrigated acres received water in sustained time frames: a) that some evidence showed several years of nonirrigation on certain lands and should therefore be excluded as being incapable of sustained irrigation, i.e., nonarable; b) that some of these acres are actually nonarable and evidence was introduced to support this claim; c) that much of the land claimed as PIA's would have benefit-cost ratios less than parity and thus would prohibit reasonable construction because of economic infeasibility; d) that valid State water permits still in existence and not

4. State's Proposed Findings, p. 1070. State witness Bishop actually accepted 31,217 acres of PIA's historically utilized on the Reservation, but this figure was a pre-economic analysis (Plaintiff's Exhibit HFB 5-A).

cancelled or expired, dating 1905 and later, cover at least 86,000 acres on the Reservation; e) that agents of the Tribes, and the United States on behalf of the Tribes, as well as individual Indians, applied for State water permits in great numbers.[5] This was asserted to show the "state of mind" of the Tribal and Federal officials; that Wyoming was then and was to be the sole source for the right to use water within the Reservation boundaries.

It is necessary to address briefly the position of the State that virtually none of the historically irrigated lands should be accorded a reserved water right because of the failure of the Federal and Tribal experts to qualify it as not only arable, and irrigable, but practicably so. Practical irrigability is indeed the test, and Wyoming argues that this standard must be applied in the same form and essence of proof to all lands for which a water claim is made. This premise belies the actual facts in this case -- that these "historic" lands include numerous farm fields, many a part of Federal Irrigation Projects long established on the Reservation, that are rich and productive and have been the basis of the agricultural life on the Reservation for decades, if not for the better part of the century. To require testing of these lands, as with future virgin turf, seemed unreasonable to me, and I believe my presumption of irrigability regarding these lands was fair and that all parties fairly understood it.[6] Like any other presumption, it asserts that the factual picture is sufficiently strong as to require an opponent's answer.

5. Plaintiff's Exhibit WRIR SR-3-Rev., SR-3, SR-4, SR-5 after the Winters decision.
6. See Adjudicated Lands section, infra, regarding the matter of a State awarded Permit or Certificate establishing a presumption of practicable irrigability.

There are certain historic areas in which the testimony presented by the experts for Wyoming succeeded in persuading me of the merit of their contentions, thus I have reduced totals of the acreage claims accordingly.

B. METHODOLOGY

1. The Case of the United States

The United States conducted a sufficiently thorough investigation of the historic lands claims. Ronald Billstein, admitted as an expert in water resource planning, testified to the methodology employed under his direction by persons at H.K.M. Associates. The historic land base claim was first identified through office review and interpretation of 1979-1980 aerial photographs, water rights records, and documents showing unrecorded irrigation of land. Later, field investigations were done to confirm or adjust the office findings.[7]

State permit boundaries and areas of irrigation on record with the Bureau of Indian Affairs, Fort Washakie Agency Office, were mapped on aerial photographs and assigned a number for identification. Principal service facilities were also noted on these photographs. Any overlapping or duplication of service areas was eliminated. Additionally, if proposed irrigation projects had never been constructed, those lands were excluded from the base.[8]

Initial documentation of unadjudicated in-use areas, those ditch systems not recorded with the State of Wyoming, was

7. Tr. p. 1901; p. 1897; United States Exhibit C-138, p. 2; Tr. p. 1925.
8. Tr. p. 1917; Tr. p. 1946; Tr. p. 1904; United States Exhibit C-138.

obtained from BIA publications. The portions of these areas outside the boundaries of adjudicated use were then marked on the aerial photographs.[9]

Photo interpretation of the 1979-1980 aerial photographs was supplemented by a review of aerial photographs dated 1936, 1939, 1948, 1954 and 1969. The comparison aided in the identification and documentation of the historic lands. Stereoscopic analysis was performed on all historic lands except within the Federal Irrigation Projects, where very complete maps of irrigation were available. Field inspectors utilized results of these large-scale stereoscopic plates for visual perspective of service to a tract, and then performed field inspection and utilized professional judgment to form their conclusions.[10]

The determination of irrigation in 1980 was not made on photo interpretation alone, even though infrared photographs were available and utilized. The reviewing United States expert relied more on the notes of field investigators than on the infrared photographs for an impression of the vegetation in the area. These investigators noted their impressions of physical features of the land and the ability of surface water to fully service land tracts, which would not have been visible even on infrared photographs. Photographs show only one instant in time, giving only an indication of what the area looks like. Additionally, water assessment records and delivery system mappings were reviewed to document water usage for irrigation.[11]

---

9. Tr. p. 1904; Tr. p. 1917; United States Exhibit C-138, p. 4.
10. Tr. p. 1912; Tr. p. 2879.
11. Tr. p. 2649; Tr. p. 2610; Tr. p. 2622; Tr. p. 2624; p.2630.

The initial field inspection of identified areas was performed by surface vehicle or helicopter. Minor additional qualifying acreage, consisting of generally isolated tracts, was discovered and added to the study base. Eventually, every tract claimed as historically in use outside the FIP's was visited by investigators.[12]

The first component of a more extended field study involved review of the condition of diversion facilities. This established whether the facility examined had suffered a blow-out[13] which would preclude continuing service without correction. It also showed the extent to which the diversion works were intact, the ditch or sprinkler systems operational, the extensiveness and definition of field laterals, and level of vegetation in the service area. Isolation of diversion works and vegetation in ditches was often deemed indicative of non-operation of the irrigation system, though it was noted that there were areas where the condition of the facilities indicated use within one or two years. A water line was considered to indicate use that year. The level or condition of vegetation in the service area would show whether an area had been irrigated within a year, or not for four or five years. Field personnel were allowed to make interpretations of use areas relative to whether they felt those lands were receiving full or partial service or seepage from canal systems.[14]

Instructions to eliminate acreage with physical obstacles were given to field investigators, and the study excluded all major drainage ways, major and secondary roads, major farm-

12. Tr. p. 1926; Tr. p. 1986.
13. Tr. p. 1927. Washout in ditch system or cross drainage dissecting ditch system.
14. Tr. p. 1926; Tr. p. 2640; Tr. p. 2874; Tr. p. 1928.

steads, river bottom lands not receiving water from man-made delivery systems, and any other significant obstacles to farming. Dirt roads into fields were not excluded on the theory that they could be plowed and added to the field and therefore presented no major stumbling blocks to the irrigation of that field.[15]

Field work was checked by cross referencing with assessment and assessability records. Field findings were compared with results of SCS Irrigated Lands Inventory. A quality control check was made against infrared photography at approximately the quadrangle scale for 1974 through 1978. Reliability of the irrigation system, though it was noted that there were areas where the condition of the facilities indicated use within one year, was verified by actual visitation to a portion of tracts and on site review of the findings.[16]

Records defining trust acreage as of April, 1980 were used to screen ownership of the study areas remaining after the field inspection. Minor modifications were approved by the Fort Washakie Office of the BIA.[17]

I find the above testimony of Mr. Billstein to be professionally competent, credible and persuasive.

On-site hydrographic verification and soils classification studies were then undertaken under the direction of United States witness Albert Kersich, President of H.K.M. Associates on all lands in the office studies base. Mr. Kersich was admitted as an expert agricultural engineer. He continued to outline the methodology used by the United States experts,

15. Tr. p. 2030; Tr. p. 2587.
16. Tr. pp. 1935-39.
17. Tr. p. 1918; Tr. p. 1920; United States Exhibit C-138, p. 5-6.

testifying that these office studies were supplemented, where possible, with interviews of landowners and lessees to determine "type of irrigation, crops grown, water supply, season of use, reasons for not irrigating idle lands, etc." Time was spent on the Reservation observing irrigation systems actually in use. The classifiers talked with the current regional soils scientist and some BIA personnel involved in irrigation management on the Reservation. Locations of irrigation facilities and levels of irrigation were noted for each tract studied. Soils on idle lands were field sampled, and in some cases lab tested, for arability. Again, necessary modifications, based on interview response and field verification thereof, were made to the total acreage claimed to reflect what was actually occurring in the field. The aerial photographs and field program results were then reviewed and the photographs were modified where necessary to accurately existing conditions. Summary of the study was done by a final planimetering and tabulation of acreage.[18]

I find the testimony of Mr. Kersich, not only on arability, but on all facets of his work, also to be professional, credible and persuasive.

Testimony on engineering studies and water requirements relative to the adjudicated, unadjudicated in-use and Type VII trust lands was presented by Thomas Stetson, president of Stetson Engineers, Inc., admitted in this case as an expert water duty engineer. Mr. Stetson also presented testimony on the costs of bringing the Type VII lands into service. Dr. Mesghinna presented similar testimony concerning the Type VIII lands.

---

18. Tr. p. 1413; Tr. p. 1126. Hydrographic study of areas determined arable lands not served by existing permits. United States Exhibit C-138, p. 9; Tr. pp. 1925-28; Tr. p. 1938; United States Exhibit C-138, pp. 8-9; Tr. p. 2020.

Both experts found that the average overall efficiency in the project areas, based upon historic diversions, is 34.7%, or 35%. This is only if the diversion requirement of the Upper Wind Unit, which is 12.06 acre feet per acre, is excluded. This particular diversion requirement has been historically higher than the requirement for other units. The water diverted for this unit flows through the system, and the amount that is not consumptively used by the crops returns rapidly to the Wind River system. Mr. Stetson testified that this was the easier way to operate in some instances.[19] State expert Floyd Bishop agreed that the average overall efficiency is probably 35%. Both Mr. Stetson and Dr. Mesghinna assumed a 35% overall efficiency for the non-project lands.[20] I make a finding on this point later in this section.

Using aerial photographs and Dr. Mesghinna's climate zone maps, Mr. Stetson located historically irrigated non-project lands within the zones and determined the appropriate cropping pattern for them. He then derived the net irrigation requirement for each area. By dividing the net irrigation requirement by the overall efficiency of 35%, he calculated the diversion requirement for the historically irrigated trust lands outside the project areas, and did this tract by tract.[21]

Stetson Engineers examined aerial photographs and topographic maps locating parcels identified as arable Type VII land by Ross Waples of H.K.M. Associates. Mr. Stetson then visited each of these tracts by helicopter to analyze their water requirements and the costs necessary to place the lands into full service. To determine these costs, he considered repair or

19. Tr. p. 5358.
20. Tr. pp. 5238-39; Tr. pp. 12167-68.
21. Tr. pp. 5240-41.

replacement of headworks, diversion structures, canal extension or enlargement, head ditches on farm units, pumps, annual energy operating requirements and operation and maintenance of each parcel,[22] and developed estimates on a per acre basis which were then given to David Dornbusch, admitted as an expert in economic feasibility.

I find the evidence of the United States' witnesses Thomas Stetson and Dr. Mesghinna to be more persuasive at most significant points, and on the matters referred to above, I find their testimony credible and persuasive.

Economic evaluation[23] performed by United States' economist Dornbusch for the Type VII and Type VIII lands was similar to his analysis of the future projects, with the exception that economic feasibility was determined for each parcel within Type VII and VIII lands. The studies initially identified crops, crop yields, and crop prices.[24] For Classes 1 through 3 lands under full irrigation, the yields were projected to be the same as in the future projects for the same crops. Yields for Class 4 lands under water short supply are based upon discussions with various agricultural extension people in Wyoming. Crop prices for historic lands were obtained as for new project lands and in fact are the same for comparable crops. The price per ton of hay is the 1979 normalized price published for nurse oat hay and grass hay. The grazing and aftermath price is the

22. Tr. pp. 5255-56.

23. Tr. p. 4933. Economic evaluation seeks to determine the true value of the resources consumed and developed in the project, where "true value" is the value from the perspective of the people most concerned with the use and consumption of those resources. Tr. pp. 4939-40.

24. Tr. p. 5719; United States Exhibit WRIRC-278; See Future Lands section, infra. Tr. p. 4939. Shown by benefit cost ratios. Tr. p. 5721 and p. 5754; Tr. pp. 4942-43; United States Exhibit WRIRC-278, pp. 18-19.; Tr. p. 4951.

same as in the new projects for aftermath per animal unit month (A.U.M.). In water short Type VII lands, the same prices are reflected as for hay and aftermath grazing on future lands. In Type VIII lands, prices were determined by project area.[25]

Based on the above, Mr. Dornbusch computed gross returns per acre, subtracting production costs per acre to obtain the net return per acre.[26] Production costs arise primarily from on-farm cultivation costs, including on-farm irrigation costs. Where lands are not as tightly clustered as in the future projects, some extra production costs were anticipated, such as the costs of extra handling and movement of essential equipment. Using fixed and variable cost analysis as in the future projects, the additional cost of equipment was computed, based on the types of equipment that would have to be moved, and the number and distances of moves within each cultivation operation.[27] He weighted net returns by crop distribution, percentage distribution, and crop mix.[28]

The cropping pattern for Type VII historic lands was predominantly nurse malt barley and alfalfa. Corn was not included, as its cultivation requires special equipment, and the concern was that there might not be sufficient Type VII lands to effectively allocate equipment use and that the Type VII lands were not close enough to project lands to use their equipment on a cooperative basis.

---

25. Tr. p. 5742, et seq.; Tr. p. 5719.
26. Tr. p. 5719; United States Exhibit WRIRC-278, pp. 20-22; Tr. pp. 5742-44.
27. Tr. pp. 5750-51; Tr. p. 6172 et seq.; United States Exhibit WRIRC-278, pp. 20-35.
28. Tr. pp. 5753-54; United States Exhibit WRIRC-278, pp. 36-37.

Both Dr. Mesghinna and Mr. Stetson made note of elevation differences and that factor's affect on growing season and suitability for crops, and different crop mixes were created for different classes of land, for full service and water short periods. In water short periods, Class 1 through Class 3 lands were allocated a mix of oat hay, nursing alfalfa and alfalfa, while the cropping pattern in Class 4 lands consisted of nurse oat hay and grass hay. This was also the crop mix for Class 4 lands under full water conditions.[29] The crop percentage distribution for Classes 1 through 3 lands is basically the same as shown for future projects, with the elimination of corn from the mix.

Recognizing that in agricultural economies a future value is something less than the present value, Mr. Dornbusch multiplied the weighted average for highland and lowland acreage by the appropriate present value factor to determine net benefit figures. Cost adjustments for opportunity costs of labor[30] and for normalization[31] were performed to compute the system costs.[32] Finally, he divided the present value of the returns, or net benefits, by the present value of the irrigation system costs as furnished by Dr. Mesghinna and Mr. Stetson, to obtain the benefit-cost ratio. A benefit-cost ratio figure of less than one was considered economically infeasible. I find the above

29. Tr. pp. 5741-42; United States Exhibit WRIRC-278, p. 19; Tr. p. 5719; Exhibit C-278, pp. 36-38; Exhibit C-271.
30. Tr. pp. 4985-86; The true cost of a resource, here labor, in the production process, measured by the value of the next best use of that resource. Tr. p. 5913; Plaintiff's Exhibit ED-6; On the Reservation, where unemployment is both substantial and persistent, the opportunity cost of labor is zero.
31. Tr. p. 4959; Application of weighting system to historic prices/costs to determine current prices/costs.
32. Tr. p. 4992; Tr. p. 5719; Tr. p. 4985; Tr. p. 4958.

testimony of David Dornbusch to be professionally competent, credible and persuasive.

David Dornbusch, as the economic expert for the United States, and Ronald G. Cummings, recognized as an expert agricultural and water resources economist for the Tribes, used 4% as the real discount rate of interest to be applied to the costs of production on the historic lands. While it may seem low in these days of steady inflation, these figures relate to the nether world of benefit-cost ratio vocabularies.[33] The analysis of the United States' economic expert is that irrigation of the Type VII and Type VIII lands included in the final totals is economically feasible, and I so find, though some is excluded on other grounds.

Though the same above detailed economic analysis was not done for unadjudicated in-use areas, Mr. Dornbusch deemed them economically feasible from the fact that the lands were being irrigated and crops being grown thereon. In light of that fact, but with the exceptions noted hereafter, the testimony from area farmers and ranchers and the large market for growing crops, the irrigation of historic lands included within the final totals is generally feasible, and I so find.

No economic analysis was done on adjudicated areas. A ruling was made that an uncancelled state permit, or adjudicated certificate of appropriation, is prima facie[34] evidence of irrigability. United States experts accepted the certificates furnished by the State of Wyoming as having met the test of irrigability, and went no further in their scrutiny thereof.[35]

---

33. For a thorough discussion of discount basis, see same subject matter in the Future Lands section, infra.
34. Tr. pp. 7205-06.
35. Tr. p. 2477. See Adjudicated Lands section, infra.

In summary, regarding the methodology of the United States' witnesses whose work is liberally footnoted in the section just completed, I find that it was competent, generally convincing, and in most cases adequate in supporting Federal claims. The exceptions are evident in the several deductions I have made in acreage from said claims, where I have as an alternative accepted the testimony of State witnesses.

2. The Case of The Shoshone and Arapahoe Tribes

The historic lands portion of the Tribes' case, as noted above, included the establishment of a reserved water right for those individual Indians who hold land in fee. This claim was not addressed by the United States.

Keith Higginson, a consulting engineer who testified for the Tribes as an expert in water resources engineering, was the dominant witness in this portion of the claim. He initially gathered available land classification information and prepared a list of property owners for each tract. A worksheet was prepared and property boundaries plotted on aerial photographs. These were the hydrographic survey photographs used by H.K.M. in their study of the historic lands. Eventually, 42 tribal members or their direct descendants were interviewed to obtain information on their fee lands and the present and potential uses of water thereon.

His field investigation of Indian owned fee land involved three different visits to the Reservation for a total of 8 days in the field. During these visits, he observed 117 of 120 identified tracts. The use and condition of each field was noted, as well as the source and apparent conveyance system for irrigated lands. Additionally, he visited the Riverton

Irrigation Project and discussed its organization and management with representatives of the United States Bureau of Reclamation.

He determined, from observation in the field and from study of available data and interviews, which tracts of land were presently irrigated and which were potentially capable of being irrigated, rather than practicably irrigable. This type of determination was based on the Tribes' contention that another method of determination of practicably irrigable acreage was comparison with acreage currently irrigated. It was Mr. Higginson's professional opinion that the lands in his potentially irrigated category compared favorably to lands already receiving water and that they were located in areas where little cost would be required to place them in service.[36]

3. The Response of the State of Wyoming

The State of Wyoming refuted the above largely through State experts' review and criticism of the work performed by the Federal and Tribal experts. They criticized Federal arability studies on historic lands often on the same basis as criticism of the Futures, claiming the Federal studies were wholly inadequate. However, when confronted by the map showing the numerous holes used by HKM in its analysis, it was apparent that the State's soils expert, Clarence Fowkes, could not say he still felt the study inadequate.[37]

State expert Sommers pursued his analysis by counting holes shown on various documents and in some instances observing parcels from the road as he drove by. When asked which

36. Tr. p. 8150, et seq.
37. Tr. p. 10735.

portion of a particular tract was arable, and the acreages of both the arable and nonarable portions, Mr. Sommers said he thought one would have to really visit the tract to tell exactly.[38] Another State expert, Leonard Rice, agreed field investigations are necessary and found it not good practice to make acreage determinations in office without the basis in reality that comes from field review.[39] This was the point raised by experts who actually went onto each tract in doing the Federal and Tribal studies. It is also one of the reasons I find the Federal and Tribal studies generally more credible, with noted exceptions to follow.

Continuing, the State called Mr. Henry Sostrom, a respected man of good professional reputation. In this instance, however, the State used him so broadly that his testimony was not always solid. While excellently qualified as a civil engineer in the field of highway construction in Wyoming, and also in the area of photo interpretation, he often was asked to testify outside his expertise, offering opinions as a soils scientist, an irrigation engineer, an agricultural engineer, an economist, and a statistician.

Additionally, Mr. Sostrom did not participate in the assessment of many tracts in a tract-by-tract analysis done by personnel with whom he had not previously worked, and was at times unable to explain why a tract may have been excluded from the final totals presented in his exhibits, often disagreeing with them.[40] Mr. Sostrom also admitted that office review of

38. Tr. p. 11149.
39. Tr. pp. 9432-9434.
40. Tr. pp. 12681; Tr. pp. 13013-15; Tr. pp. 13036-37; Tr. pp. 12953-54.

aerial photographs, without extensive ground-truthing, was not standard procedure for mapping irrigated lands.[41]

Although I have considered the testimony of both Mr. Sommers and Mr. Sostrom of limited significance for the above reasons, I have given them the benefit of the doubt they have raised in my mind about certain shortcomings in the Federal and Tribal claims. Acreage totals have thus been reduced accordingly, as noted in the following sections.

In considering Type VII and Indian Fee potentially irrigable acres, State economic expert James J. Jacobs made several assumptions which are clearly at odds with the reality of the circumstances now existing in the Division and likely to exist in the future. He assumed all of these parcels would be worked by existing irrigators and no unemployed labor would be used. This is possible, certainly, in some instances, but not all. Some of this land may be redeveloped with the Futures, and be tilled by presently unemployed labor. Additionally, it is impossible to ignore the recognized higher rate of unemployment on the Reservation.[42] Some of the unemployed may well be used if more land, including now idle land, is put into production.

Further afield, he assumed each tract of this land placed in production would require a full complement of new machinery, fully costed. He assumed, based on results of State expert Agee's interviews with area irrigators that as the limit under the law for families in the reclamation areas is 320 acres, the maximum size of a farm in the area would be 320 acres. Though acknowledging that Indian irrigators in the area are not held to that limitation, and admitting that some efficiency could

41. Tr. p. 12598.
42. Tr. p. 5913; Plaintiff's Exhibit ED-6; Tr. p. 4985.

be achieved on a larger unit, he held to this farm size through cross examination.[43]

This type of acreage limitation correspondingly limits the hours of usage of farm equipment. Dr. Jacobs testified that a bean hoe planter would only be used 12 hours per year, a rotary hoe only 14 hours a year. (I cannot help but believe he meant days, not hours.) On cross examination, he denied that additional hours of usage of that machinery on a larger size farm would result in greater efficiency. When asked to assume a bean planter could be operated ten times more efficiently if there were no acreage limitations, he felt the savings would be negligible and declined to consider that assumption realistic.[44] Essentially, he refused, even hypothetically, to consider a larger farming unit.

Applying Dr. Jacob's assumptions to a real situation, an existing irrigator with no restrictions as to the size unit he can operate is faced with the expenditure of many thousands of dollars in equipment costs alone should he decide to cultivate 80 acres of idle land contiguous to a 320 acre unit. This would be in spite of the fact he might use his existing bean hoe planter another three days a year on that additional 80 acres without obviously jeopardizing the timing of his operations or his crop because of any timing adjustment necessary for that additional use. It is also doubtful this would cause sufficient additional usage of the machine that any repair costs would greatly offset the additional returns of that 80 acres.

The inapplicability of Dr. Jacob's assumptions were further highlighted when an irrigator testifying at the last Worland hearings stated he operated a 1,000 acre farm/ranch. He

43. Tr. pp. 14844, et seq.
44. Tr. pp. 14848-54.

thought it unrealistic and economically impractical to break that up in 320 acres units, each with its own contingent of farm equipment.[45]

I find the assumptions of the State's economist Jacobs hard to apply to the real world. In taking an inflexible position, he has biased his costs to the detriment of his analysis, which I must consider inadequate to advance the State's claim that the benefit-cost ratios of the historic lands studied are below unity.

It remains that the costs and returns advanced by the United States and the Tribes must be considered in light of the appropriate discount rate. Here, I refer to my consideration of this issue in the Futures section, infra.

C. ADJUDICATED LANDS

Adjudicated historic lands, as noted above, are trust lands for which an uncancelled permit or certificate of appropriation has been issued by the State of Wyoming. These lands are located throughout the Reservation, but are predominate in the area of the Federal Irrigation Projects, served from the Ray, Coolidge and Sub Agency Canals in the Upper Wind Unit, the Wind River "A" and Dinwoody Canals in the Little Wind Unit, the Johnstown Unit, the Lefthand Unit, Midvale Irrigation District and Riverton-LeClair Irrigation District, all within the Wind River Basin and Little Wind River Basin. Throughout the years, even after the Winters decision, Indians and non-Indians alike were uncertain of the actual meaning of "reserved water

45. Tr. p. 14345W.

rights." That confusion exists today. Persons taking title from Indians assert their ownership of a reserved water right, just as Indians assert their paramount right to reserved water. And yet, many persons have "protected" their water right by applying for and perfecting state awarded permits. Outside the Federal Irrigation Projects, a significant portion of Reservation lands have some sort of permit of record with the State Engineer's Office. This permitting seems to have been done, for the most part, between 1905 and 1915.[46]

Some evidence was introduced to reveal the uncertainty and confusion that followed the 1905 "opening up" of the Reservation, during which time the State issued permits to Tribal sources on the "diminished portion" as well as to the settlers on the ceded lands that had gone to patent.[47]

Further, the Federal parties argue that issuance of a State Permit is proof of the irrigability of these acres, and assert that the evidence of their qualification for a reserved water right is contained in the very records of the State Engineer's office.[48]

I take departure from such a conclusion, but early in the proceedings did hold that such an uncancelled State Permit is prima facie evidence of irrigability of these tracts. A dialogue with counsel for the United States, Tom Echohawk, affirms that

46. Tr. pp. 1898 and 1946; Tr. p. 2562.
47. Plaintiff's Exhibit SR-7.
48. United States' Proposed Findings, p. 279; "These records contain certification by officials of the State...that water was delivered to lands described and that such systems were placed therein so as to warrant adjudication by the State Board of Control".

if said lands were to be excluded, evidence of said disqualification would have to be forthcoming from the State.[49]

I have reviewed much of the evidence which the State experts presented, and many of my findings herein will result in subtractions from the claimed totals simply because I believe the State did indeed, on certain tracts, meet its duty to "come in and put on evidence to show that the land isn't irrigable."

The history and nature of the subject matter we are working with is replete with evidence of projects that began with apparent facts to warrant a certain acreage. In instance after instance, a project resulted of much less acreage either approved or authorized. Witness Sommers did indeed rebut the assumption of irrigability of all lands claimed by bringing out out several instances in his exhibits of questionable factual conditions pertaining to whether certain tracts should be given a reserved right.

While it is understandable that the Federal and Tribal attorneys may not share my belief that the evidence presented by the State met the Echohawk challenge to present "by whatever method they choose" evidence of non-irrigability, I believe it was accomplished, albeit not to the total of excluding "approximately 50% as nonarable" as was testified to by State

---

49. Tr. pp. 7205-09:

> "THE SPECIAL MASTER: I have ruled it establishes prima facie case for irrigability.
>
> * * *
>
> THE SPECIAL MASTER: I would rather think that the fairest way to handle this question would be to put the burden of proof upon the State to show that if certain parcels on some of these areas are not yielding crops, have had a drainage problem, don't deserve water, so the speak, that I would consider to reduce the number of acres entitled to water on that type of evidence. ...(continued)

expert Sommers.[50] I believe the totals of adjudicated lands entitled to a reserved right of water should be reduced by the following:

Land types known as "out" land (Type IX)	845.9
Class 6 lands	2,971.7
Class 6 lands	360.5[51]
Retired lands	829.0
Type VIII lands with no economic analysis	10.0[52]
TOTAL	5,017.1

49. (continued)...

Generally speaking, I'm going along with the presumption that if it had a water right issued to it, it's irrigable land. Whether it's entitled to a water claim for reserved water for it, and I don't think -- we are not talking about too many acres in the first place, are we?

MR. ECHOHAWK: We are talking about approximately 17,000 acres, and that's our point exactly. The State of Wyoming has the same opportunity with regard to the adjudicated lands as they do with regard to the North Crowheart area. If they want to come in and put on evidence to show that that land isn't irrigable, is not irrigable by whatever method they choose to show, that's one thing.

THE SPECIAL MASTER: Whether it was irrigated and was not yielding productively and went into idle status for ten or fifteen years, because it was not productive land, I think that's acceptable evidence.

MR. ECHOHAWK: But because the land is currently idle, that in and of itself should not bump that land out. They should have to show something else, the same as North Crowheart is.

THE SPECIAL MASTER: No problem.

50. Tr. p. 11017; Plaintiff's Exhibit SS-1001.
51. Plaintiff's Exhibit SS-1002.
52. Plaintiff's Exhibit SS-2.

While Mr. Sommers acknowledged that 116.5 acres noted as Class 6 land by him on Wyoming Exhibit SS-1002 were actually Type VII land and possibly arable, no economic analysis was performed on these acres; thus no showing of PIA was made.[53] For this reason, they cannot be added to the Type VII acreage awarded.

The State of Wyoming correctly argued that certificates are not proof of irrigability, and met the test in eliminating the 5,017.1 acres mentioned above, but generally did not, in my opinion, prove that water was not being beneficially applied on the remaining 12,395 acres.

There is ample evidence in the record to substantiate and support findings that Class 6 lands are not entitled to water rights on the same basis as lands Classed 1 through 4, and it is apparent that land classification requirements by the Bureau of Land Management were dealt with more rigidly than by HKM.[54]

I therefore find that the 17,411 acres claimed by the United States as a measure of the reserved water right based upon adjudicated trust lands be reduced by 5,017 acres to an award of 12,395 acres as the measure, summarized as follows:

---

53. Tr. p. 12451.

54. Plaintiff's Exhibit HB-51, for example, lists the following conversation record between Engineer Carl Johnson of the Midvale Irrigation District, and Loring Gurney and Ross Waples of HKM. Attempts were made to try to account for differences in acreage that the District shows to be irrigated as opposed to what HKM shows to be irrigated. "The only lands which the District can charge for are Classes 1 through 4. Class 6 lands can be irrigated through temporary water service contracts for a period of five years. If after that time USBR deems the lands productive, then the Classes are changed to a pay class. At present, Indian lands are only receiving water on pay classes of land."

Little Wind Unit		457 Acres
Upper Wind Unit		445 Acres
Lefthand Unit		3 Acres
Wind River Basin		4,983 Acres
Little Wind River Basin		729 Acres
Bighorn River Basin		2,757 Acres
Popo Agie River Basin		303 Acres
Owl Creek Basin		2,718 Acres
	TOTAL	12,395 Acres

A tract-by-tract analysis was completed using Sommers testimony and exhibits SS-1002 and SS-2, and adjudicated acreage deletions resulting therefrom were made, and are summarized by source, as follows:

Source	SS-1002 Class 6 Acres	SS-2 Type IX Acres	SS-2 Class 6 Acres	SS-2 Type VII Acres	TOTAL Acres
PROJECT LANDS (WRFIP)					
Little Wind Unit:					
Ray Canal		4.9		10.0	14.9
Coolidge Canal		76.0	99.2	11.0	186.2
SUBTOTAL		80.9	99.2	21.0	201.1
Upper Wind Unit:					
Dinwoody Canal		37.0			47.0[55]
Lefthand Unit:	4.0	12.0		1.0	17.0
PROJECT LANDS SUBTOTAL	4.0	129.9	99.2	22.0	265.1

55. Ten acres of Type VIII on Dinwoody Canal were also deleted. This was the only Type VIII land deletion made.

Source	SS-1002 Class 6 Acres	SS-2 Type IX Acres	SS-2 Class 6 Acres	SS-2 Type VII Acres	TOTAL Acres
NON-PROJECT LANDS					
Wind River Basin					
East Fork Wind River			228.3	9.0	237.3
Dry Pasup Creek		74.0	180.0	267.0	521.0
Crow Creek	116.5		282.9	180.0	579.4
Willow Creek				2.0	2.0
Main Stem Wind River	145.0	17.2	228.7	31.0	421.9
SUBTOTAL	261.5	91.2	919.9	489.0	1,761.6
Little Wind River Basin:					
North Fork Little Wind River			48.4		48.4
Mill Creek				9.0	9.0
Sage Creek		21.6	11.5	17.0	50.1
SUBTOTAL		21.6	59.9	26.0	107.5
Bighorn River Basin:					
Main Stem Bighorn River			61.0	11.0	72.0
Cottonwood Creek		14.7	10.0	58.0	82.7
Muddy Creek		10.0	597.7	143.0	750.7
SUBTOTAL		24.7	668.7	212.0	905.4
Popo Agie River Basin:					
North Fork Popo Agie		42.0	5.0	1.0	48.0
Main Stem Popo Agie		8.9			8.9
SUBTOTAL		50.9	5.0	1.0	56.9
Owl Creek Basin:					
South Fork Owl Creek	95.0	281.3	593.9	32.0	1,002.2
Main Stem Owl Creek		246.3	499.4	28.0	773.7
Mud Creek			125.7	19.0	144.7
SUBTOTAL	95.0	527.6	1,219.0	79.0	1,920.6
NON-PROJECT LANDS SUBTOTAL	356.5	716.0	2,872.5	807.0	4,752.0
TOTAL DELETIONS:	360.5	845.9	2,971.7	829.0	5,017.1

D. UNADJUDICATED IN-USE LANDS

Generally, unadjudicated in-use areas are unpermitted, and therefore unrecorded with the State Engineer's Office. In some instances these lands are associated with ditch systems documented by the Bureau of Indian Affairs. Other tracts were found by reviewing previous land use inventories, assessment and assessability records, or by interviewing local residents.

The United States claimed water for 34,427 acres of land, lying outside adjudicated service areas, which is presently receiving irrigation water. As the Winter's doctrine speaks in terms of present as well as future uses, it would seem that the claim for water to serve currently irrigated lands would be the least controversial. However, the State argued that the claim fails for two reasons: (1) conceptual deficiencies, and (2) factual deficiencies.

Having addressed the State's conceptual deficiencies argument earlier, I consider here only the factual deficiencies claim. I find that the State's review of evidence presented by the United States' experts showed 3,575.9 acres of Class 6 lands in the unadjudicated in-use claim.[56] Throughout the hearing of this matter, I have accepted and been guided by the definition of lands set forth by the United States. Under that set of definitions, Class 6 land is that which does not meet the minimum standards or requirements for arability under the land class standards used by the Federal experts. There was no subsequent showing by the United States that these lands had not been classified "6" by their experts. This land must therefore be deducted from the total acreage claimed in this subcategory as being, essentially by admission, nonirrigable.

56. Tr. p. 12441; Plaintiff's Exhibit SS-1000.

Additionally, 879 acres were discovered by the State's experts to have notations in the United States' evidence which discredit their irrigability.[57] I find these lands could not be practicably irrigable for the reasons found in the logs of the Federal experts, which also remained unexplained and unrebutted. State's expert Sostrom, in his review of United States' expert Billstein, found that 1,778 acres of subirrigated land had been included in unadjudicated in-use totals. Mr. Billstein admitted in testimony on March 19, 1981, that such land had been classified as nonarable acreage. There was no subsequent showing that the parcels claimed, or comparable parcels, were capable of sustaining irrigation over a period of time sufficient to overcome that nonarable classification. I find these acres are not practicably irrigable and have deducted them, as well as the acres highlighted by Mr. Sommers, from the final claim for unadjudicated in-use lands. Mr. Sommers pinpointed another 55.6 acres in this claim that are Type VII land. This acreage was not analyzed by Mr. Dornbusch for economic feasibility and therefore must also be deducted from acreage claimed as in-use or Type VII as acreage for which no showing of practicable irrigability was made.

The State also contended that two parcels of unadjudicated in-use land claimed as trust land are in fact owned by non-Indians. An examination of United States Exhibits C-317, C-317-1, and 317-2 confirms this statement. These parcels are deducted from the claim for this portion of the claim:

57. Tr. p. 12444; Plaintiff's Exhibit SS-1001.

Parcel 8-7	
Midvale Irrigation District	
SW¼SW¼, Section 17, T2N, R6E	8 Acres
Parcel 19-12	
Main Stem Wind River	
NW¼SE¼, Section 27, T4N, R3W	2 Acres
TOTAL	10 Acres

I therefore find that the 34,427 acres claimed by the United States as a measure of the reserved water right based upon unadjudicated in-use lands should be reduced by 6,298 acres to an award of 28,129 acres as the measure, summarized as follows:

Little Wind Unit	14,776 Acres
Upper Wind Unit	4,763 Acres
Johnstown Unit	426 Acres
Lefthand Unit	751 Acres
Midvale Irrigation District	561 Acres
LeClair Irrigation District	976 Acres
Wind River Basin	968 Acres
Little Wind River Basin	3,071 Acres
Bighorn River Basin	1,426 Acres
Popo Agie River Basin	152 Acres
Owl Creek Basin	259 Acres
TOTAL	28,129 Acres

A detailed study was made of the exhibits cited above. Unadjudicated acreage deletions were made therefrom and are summarized by source on the following tables:

UNADJUDICATED ACREAGE DELETIONS BY SOURCE

Source	Plaintiff's Exhibit SS-1000 Nonarable Acres	Plaintiff's Exhibit SS-1001 Miscellaneous Acres	United States Exhibit 317 et seq. Acres	Plaintiff's Exhibit HSO-2 2nd Rev. Acres	Total Acres
PROJECT LANDS:					
WIND RIVER FEDERAL IRRIGATION PROJECT:					
Little Wind Unit:					
Ray Canal	511.9	----	----	157.0	668.9
Coolidge Canal	1,097.1	----	----	66.0	1,163.1
Sub Agency Canal	420.4	15.2	----	57.0	492.6
Subtotal	2,029.4	15.2	----	280.0	2,324.6
Upper Wind Unit:					
Wind River "A" Canal	19.1	115.4	----	----	134.5
Dinwoody Canal	----	28.0	----	705.0	733.0
Subtotal	19.1	143.4	----	705.0	867.5
Johnstown Unit:	38.9	----	----	----	38.9
Lefthand Unit:	789.7	----	----	----	789.7
MIDVALE IRRIGATION DISTRICT:	----	----	8.0	----	8.0
RIVERTON-LECLAIR IRRIGATION DISTRICT:	93.7	201.6	----	----	295.3
TOTAL PROJECT ACREAGE DELETIONS:	2,970.8	360.2	8.0	985.0	4,324.0

UNADJUDICATED ACREAGE DELETIONS BY SOURCE

Source	Plaintiff's Exhibit SS-1000 Nonarable Acres	Plaintiff's Exhibit SS-1001 Miscellaneous Acres	United States Exhibit 317 et seq. Acres	Plaintiff's Exhibit HSO-2 2nd Rev. Acres	Total Acres
NON-PROJECT LANDS:					
WIND RIVER BASIN					
Dinwoody Creek	36.9	----	----	----	36.9
Dry Creek	----	113.9	----	----	113.9
Meadow Creek	3.5	----	----	----	3.5
Crow Creek	1.7	----	----	----	1.7
Willow Creek	6.5	----	----	----	6.5
Main Stem Wind River	5.6	----	2.0	----	7.6
TOTAL	54.2	113.9	2.0	----	170.1
LITTLE WIND RIVER BASIN					
North Fork Little Wind River	95.8	282.9	----	600.0	978.7
South Fork Little Wind River	70.4	----	----	186.0	256.4
Sage Creek	27.4	----	----	----	27.4
TOTAL	193.6	282.9	----	786.0	1,262.5
BIGHORN RIVER BASIN					
Cottonwood Creek	----	122.0	----	----	122.0
Five Mile Creek	95.3	----	----	----	95.3
Muddy Creek	234.7	----	----	----	234.7
TOTAL	330.0	122.0	----	----	452.0
POPO AGIE RIVER BASIN					
Main Stem Popo Agie	27.3	----	----	7.0	34.3
TOTAL	27.3	----	----	7.0	34.3
OWL CREEK BASIN					
Mud Creek	----	55.6	----	----	55.6
TOTAL	----	55.6	----	----	55.6
TOTAL NON-PROJECT ACREAGE DELETIONS:	605.1	574.4	2.0	793.0	1,974.5
TOTAL ACREAGE DELETIONS	3,575.9	934.6	10.0	1,788.0	6,298.5

E. TYPE VII LANDS

Type VII lands are trust lands now idle though formerly irrigated. In most instances these parcels are located near existing service works. Many lie adjacent to streams and rivers. They are generally small and often oddly shaped tracts.

Investigation of these lands was conducted by Federal consultants in the manner previously discussed. Each tract was visited. Soil samples numbering 1,084 were taken and lab analyzed.[58] For idle lands within existing projects, land classification standards were the same as for the Futures. Modifications concerning soil texture and drainage were made for the classification of Type VII lands outside the projects.

Further modifications were made for economic analysis. The United States economist, Dornbusch, used additional machinery costs for isolated idle parcels. He adjusted cropping patterns and reduced yields for Class 4 and water short lands. After his benefit-cost analysis at a 4% real rate of interest, the United States' evidence showed 7,946 acres remaining feasible out of the original Type VII claim of 8,002 acres.[59]

In historic, non-project, unadjudicated lands, I find that Mr. Sommers is correct in his observation that it was not a good practice to exclude the drainage requirement and depth of good, free-working soil in the non-project lands and standards.[60] One example of an errant result is cited in Mr. Waples failure to follow his own standards. Mr. Waples used his own judgment rather than the HKM standard in determining

58. United States Exhibit C-226, pp. 12-13.
59. Tr. p. 5759.
60. Tr. pp. 11138-9.

the arability of parcels with high alkalinity.[61] In addition, Mr. Waples classified forty-one tracts less than five acres in size. These tracts total 102.5 acres and require an annual diversion of nearly 600 acre-feet.[62] Also, it appears that Mr. Waples did not adhere to the minimum tract size standards for twelve tracts classified Class 2 gravity, which are less than ten acres in size. These are noted on Exhibit C-226 (Table 6 and 7).[63]

I cite this to sustain my finding that the arability conclusions of the Federal experts for Type VII lands had deficiencies which warranted subtracting the areas so removed from arable acres.

As with the adjudicated and unadjudicated in-use lands, the State noted several instances where the United States' experts' lands classifications were not followed. Mr. Sommers stated that his investigation of the exhibits and testimony showed numerous instances of such departure and he reduced his acreage opinion accordingly.[64] Comparison of the United States' arable land maps with acreage the United States' expert Dornbusch found economically infeasible reveals that many of the parcels so eliminated were classed either "Class 4 gravity/Class 4 sprinkler" or "Class 4 gravity/Class 6 sprinkler".[65] This is further support for my conclusion that Class 4 and

61. Tr. pp. 3601-13; Tr. pp. 3665-73.
62. United States Exhibit WRIRC-226. Sixteen of these tracts were subsequently eliminated by Mr. Dornbusch, who, after analysis, found them to be economically infeasible. The remaining 25 tracts total 78.2 acres and, at 40% efficiency, require an annual diversion of 371 acre-feet.
63. Three of these were also eliminated by Mr. Dornbusch after his economic analysis. The remaining nine tracts total 51.3 acres and, at 40% efficiency, require an annual diversion of 253 acre-feet.
64. Plaintiff's Exhibit SS-7 Rev.
65. United States Exhibits C-151 through 202.

Class 6, Type VII lands are simply too marginal to be awarded a finding of practicably irrigable acreage.

It is therefore my finding that Class 4 and Class 6 lands should be excluded from Type VII lands. This exclusion results in the elimination of 1,546 acres with a total diversion of about 7,771 acre-feet.[66]

I find there was a relaxation of standards used by Federal experts on the Type VII's when applied to comparable Type VIII's in the historic lands, particularly in the non-project areas. This fact, coupled with the obvious concern regarding any land asserted as practicably irrigable that has appearances or evidence of a drainage problem, or that has nevertheless been idle for long periods, does in my opinion warrant exclusion. Furthermore, I have given credence to those portions of State witness Sommers' testimony which would justify exclusion of those lands which simply do not have sufficient depth to water table and consequently classify as wet lands, or subirrigated by seepage from adjoining irrigated lands, and therefore should not be given the consideration as

66. The State of Wyoming's Findings of Fact, p. 916, states as follows:

> The Bureau of Reclamation requires special engineering and economic analysis to support the inclusion of Class 4 in a determination of arability. Wyoming Exhibit SN-5 (Section 115.4.2B). Mr. Waples admitted that he and HKM did not conduct specific engineering and economic analysis prior to including Class 4 lands. TR 3546.
>
> The Bureau of Reclamation down-classed most Class 4 land to Class 6 in their drainage investigations on the Federal Irrigation Projects on the Reservation. Wyoming Exhibit WRIR SS-A6 (p. 7). In addition, the Bureau has never mapped Class 4 land in anticipation of irrigation on the Wind River Indian Reservation and adjacent areas. Wyoming Exhibits WRIR SF-1, SS-6 and SK-10.

practicably irrigable lands and are accordingly denied a reserved water right.

Careful review of the evidence of virtually all of the Federal experts in this regard, compared to that of State witness Sommers, was again indulged in by me in order to determine that measure of credit to be given to the subtractions from Federal totals in view of my general credence that the Sommers' position was well taken and that there was simply more Type VII lands considered arable than was factually the case.

This is not to say that I have departed from my general belief, repeated often in this Report, that by and large the work of the experts for the United States and the Tribes was professional, competent, believable and more worthy of consideration as foundation engineering data with which to begin the massively complex and painfully difficult job of determining practicably irrigable acres on this Reservation. It is to say that these experts are first engaged in the handling of tens of thousands of documents and figures with an inevitable factor of error in the daily operations so involved; that the business of agricultural science engineering and soil classification is not exact; and that competent men of good will and of total dedication to the truth can find wide disparities in their conclusions from similar sets of facts.

Comparison of Mr. Sommers' apt observations with Plaintiff's Exhibit WRIR HS-11, introduced on cross-examination of Mr. Stetson, shows that many of the parcels to which Mr. Sommers objected were indeed deleted by Mr. Dornbusch as economically infeasible. Adjustment during review was made for two parcels erroneously contained in the adjudicated and unadjudicated in-use totals. Additional parcels not meeting the

standards of the United States bring the total of nonarable acres to 1,675. A tract by tract analysis of the deletions is set forth as follows, showing arable eliminations in Type VII lands final claim, taken from comparison of Plaintiff's Exhibits SS-7 Rev. and HS-11 with United States Exhibits C-136 through C-202:

TYPE VII ACREAGE DELETIONS

Source	Classification Gravity	Sprinkler	Acres
PROJECT LANDS:			
WIND RIVER FEDERAL IRRIGATION PROJECT:			
Wind River Unit:			
RAY CANAL			
Parcel 1-8x	Class 4	Class 4	64.2
Parcel 1-10x	Class 4	Class 4	43.1
Parcel 1-11x	Class 4	Class 4	15.0
Parcel 1-12x	Class 4	Class 4	38.1
Parcel 1-13x	Class 4	Class 4	27.2
Parcel 1-14x	Class 4	Class 4	23.6
Parcel 1-17x	Class 4	Class 6	10.9
Parcel 1-18x	Class 4	Class 6	40.6
Parcel 1-19x	Class 4	Class 6	11.4
Parcel 1-28x	Class 4	Class 4	44.1
Parcel 1-29x	Class 4	Class 6	13.0
Parcel 1-40x	Class 4	Class 6*	3.0
Parcel 1-41x	Class 4	Class 6*	3.0
Parcel 1-44x	Class 4	Class 3	23.4
Parcel 1-50x	Class 2	Class 6*	8.9
Parcel 1-57x	Class 4	Class 4	63.5
Parcel 1-59x	Class 4	Class 4	14.0
Parcel 1-60x	Class 4	Class 4	41.2
Parcel 1-61x	Class 4	Class 6	21.8
Parcel 1-62x	Class 4	Class 4*	4.4
	RAY CANAL TOTAL		514.4

TYPE VII ACREAGE DELETIONS

Source	Classification Gravity	Sprinkler	Acres
COOLIDGE CANAL			
Parcel 2-16x	Class 4	Class 4	46.0
Parcel 2-24x	Class 4	Class 6	39.2
Parcel 2-25x	Class 4	Class 4	59.0
Parcel 2-26x	Class 4	Class 4	53.8
Parcel 2-28x	Class 3	Class 6*	3.4
Parcel 3-32x	Class 4	Class 6	10.7
Parcel 2-34x	Class 2	Class 6*	7.2
Parcel 2-35x	Class 2	Class 6*	8.5
Parcel 2-36x	Class 3	Class 6*	4.9
Parcel 2-55x	Class 3	Class 6*	1.0
COOLIDGE CANAL TOTAL			233.7
SUB AGENCY CANAL			
Parcel 3-10x	Class 4	Class 3	16.9
SUB AGENCY CANAL TOTAL			16.9
Upper Wind River Unit:			
WIND RIVER "A" CANAL			
Parcel 4-1x	Class 4	Class 4	39.6
WIND RIVER "A" CANAL TOTAL			39.6
Johnstown Unit:			
Parcel 6-3x	Class 4	Class 4	138.0
JOHNSTOWN UNIT TOTAL			138.0
Lefthand Unit:			
Parcel 7-3x	Class 6	Class 3	90.1
Parcel 7-10x	Class 2	Class 6*	9.7
Parcel 7-12x	Class 2	Class 6*	4.8
Parcel 7-21x	Class 6	Class 3	29.6
Parcel 7-22x	Class 3	Class 3*	2.0
LEFTHAND UNIT TOTAL			136.2
Riverton-LeClair Irrigation District:			
Parcel 9-4x	Class 3	Class 6*	4.7
Parcel 9-5x	Class 3	Class 6*	4.9
RIVERTON-LECLAIR IRRIGATION DISTRICT TOTAL			9.6
TOTAL PROJECT DELETIONS			1,088.4

*These parcels did not meet the size specifications required by United States' experts.

TYPE VII ACREAGE DELETIONS

Source	Classification Gravity	Classification Sprinkler	Acres
NON-PROJECT LANDS:			
WIND RIVER BASIN:			
East Fork Wind River:			
Parcel 10-1x	Class 4	Class 6	41.0
Dry Creek:			
Parcel 12-1x	Class 3	Class 6**	3.5
Dry Pasup Creek:			
Parcel 15-3x	Class 2	Class 2**	2.0
Parcel 15-6x	Class 3	Class 3**	4.2
Parcel 15-7x	Class 4	Class 6	66.3
Parcel 15-8x	Class 3	Class 2**	4.7
Crow Creek:			
Parcel 16-3x	Class 4	Class 4	25.3
Parcel 16-4x	Class 3	Class 6**	3.6
Parcel 16-12x	Class 3	Class 2**	0.7
Parcel 16-14x	Class 2	Class 6**	1.5
WIND RIVER BASIN TOTAL			152.8
LITTLE WIND RIVER BASIN:			
North Fork Little Wind River:			
Parcel 22-1x	Class 4	Class 4	39.9
Parcel 22-2x	Class 4	Class 4	24.4
Parcel 22-4x	Class 4	Class 4	45.4
Parcel 22-9x	Class 4	Class 4	49.4
South Fork Little Wind River:			
Parcel 23-1x	Class 4	Class 4	15.3
Main Stem Little Wind River:			
Parcel 24-9x	Class 4	Class 4	37.8
Parcel 25-17x	Class 4	Class 4	57.7
Mill Creek:			
Parcel 37-1x	Class 4	Class 6**	4.6
Parcel 37-2x	Class 4	Class 6**	3.4
Parcel 37-3x	Class 4	Class 6**	1.1
Parcel 37-4x	Class 4	Class 6**	0.6

TYPE VII ACREAGE DELETIONS

Source	Classification Gravity	Sprinkler	Acres
Crooked Creek:			
Parcel 26-1x	Class 4	Class 6**	2.6
Trout Creek:			
Parcel 27-2x	Class 4	Class 4	63.0
LITTLE WIND RIVER BASIN TOTAL			345.2
BIG HORN RIVER BASIN:			
Cottonwood Creek:			
Parcel 18-1x	Class 3	Class 6**	3.2
Parcel 18-3x	Class 3	Class 6**	4.7
Parcel 18-6x	Class 4	Class 4	39.8
Muddy Creek:			
Parcel 20-18x	Class 3	Class 6**	0.8
Parcel 20-19x	Class 3	Class 6**	1.1
BIG HORN RIVER BASIN TOTAL			49.6
POPO AGIE RIVER BASIN:			
North Fork Popo Agie River:			
Parcel 31-1x	Class 4	Class 6	5.1
Parcel 31-2x	Class 4	Class 6	9.0
POPO AGIE RIVER BASIN TOTAL			14.1
OWL CREEK BASIN:			
South Fork Owl Creek:			
Parcel 33-2x	Class 3	Class 6**	4.9
Parcel 33-4x	Class 4	Class 1	8.0
Mud Creek:			
Parcel 35-2x	Class 2	Class 6**	8.0
Parcel 35-3x	Class 2	Class 2**	0.7
Parcel 35-5x	Class 3	Class 6**	3.2
OWL CREEK BASIN TOTAL			24.8
TOTAL NON-PROJECT DELETIONS			586.5
TOTAL PROJECT AND NON-PROJECT DELETIONS			1,674.9

**These parcels did not meet the size specifications required by United States' experts.

I therefore find that the 7,946 acres claimed by the United States as a measure of the reserved water right based upon Type VII lands be reduced by 1,675 acres to an award of 6,271 acres as the measure, summarized as follows:

Little Wind Unit	2,365 Acres
Upper Wind Unit	452 Acres
Johnstown Unit	51 Acres
Lefthand Unit	451 Acres
LeClair Irrigation District	90 Acres
Wind River Basin	572 Acres
Little Wind River Basin	1,759 Acres
Bighorn River Basin	277 Acres
Popo Agie River Basin	88 Acres
Owl Creek Basin	166 Acres
TOTAL	6,271 Acres

F. TYPE VIII LANDS

The next category of historic land claimed by the United States for the Tribes is Type VIII land and land within the Owl Creek Unit. This land has more of the attributes of the futures projects than of the land discussed immediately above as presently or previously irrigated. During the United States case in chief, counsel advanced evidence to support the claim of 1,461 acres of this land.[67]

Type VIII land lies within the boundaries of the Wind River Federal Irrigation Projects in the Upper Wind Unit, Coolidge Unit, Ray Unit, Subagency Unit and Johnstown Unit. The Owl Creek Unit does not lie within these boundaries. It was sometimes referred to as the Arapahoe Ranch and is located in some of the northern-most portions of the Reservation.[68] It

67. United States Exhibit WRIR C-277.
68. Tr. p. 5582.

was identified as future project land and its arability determined by HKM Associates and testified to by Mr. Kersich. Attorney Michael D. White for the State stipulated "that a comparison of the Type VIII lands and the Arapahoe ranch lands with the [Tribes'] Exhibits M-1 and M-2 would disclose that those lands are currently in trust either for the tribes or individual Indians, or within the stipulated boundaries of the reservation,...and are not reacquired."[69] The land status indices introduced by Mrs. Eckmann for the United States confirms this.[70]

The procedures used by the United States and the State to evaluate the Type VIII and Owl Creek Unit lands were very similar to those used by them respectively to evaluate the future projects.[71]

Dr. Mesghinna evaluated this portion of the historic lands claim for the United States in the same manner as he evaluated the projects mentioned in the Futures section hereof. Since the Type VIII lands are within the boundaries of existing projects, however, no costs for canals or related structures were estimated.[72] His designs were limited to lands classified Class 1, 2 or 3.[73]

Mr. Dornbusch for the United States reviewed Dr. Mesghinna's estimates, as he did for the Futures, and determined which parcels would provide sufficient economic return to

69. Tr. p. 5597.
70. United States Exhibits WRIRC-317, C-317-1, C-317-2.
71. United States Exhibit WRIRC-226, p. 2; Tr. pp. 10963-64, Plaintiff's Exhibit SS-8 Rev.; Tr. pp. 14719-55, Plaintiff's Exhibits EJ-3, Part II, p. 19 and EJ-4, Part III, p. 16.
72. Tr. pp. 5583-84.
73. Tr. pp. 5588-89, United States Exhibit WRIRC-43, pp. 8-9.

justify their cultivation. Acres that could not be feasibly irrigated from a strictly engineering standpoint and those which would not be economically feasible to develop were eliminated from consideration and claim. Thereafter, Dr. Mesghinna excluded 5% of the remaining acreage to eliminate land on which farmsteads and other man made structures would interfere with its cultivation.[74]

As I have noted in my discussion of the Type VII land base, many parcels eliminated by the United States' economist Dornbusch were classed either Class 4 gravity/Class 4 sprinkler or Class 4 gravity/Class 6 sprinkler.[75] He also deleted land classed as Class 6 gravity/Class 4 sprinkler. These lands are too marginal to be used as a measure for a reserved right, as I have previously found regarding the Type VII lands. A review of United States Exhibits WRIR C-158 through C-202 and Plaintiff's Exhibit WRIR SS-7 Rev. shows that 179 acres in the Coolidge Unit are economically feasible, rather than the 200 acres claimed. These parcels are:

	Classification		
Number	Gravity	Sprinkler	Acres
Parcel 2-3x	Class 2	Class 1	35.7
Parcel 2-4x	Class 2	Class 2	43.1
Parcel 2-5x	Class 2	Class 2	100.2
		TOTAL	179.0

74. Tr. pp. 5604-5.
75. United States Exhibit WRIRC-226.

I therefore find that the 1,461 acres claimed by the United States as a measure of the reserved water right based upon Type VIII lands be reduced by 21 acres to an award of 1,440 acres as the measure, summarized as follows:

Ray Canal		28 Acres
Coolidge Canal		179 Acres
Sub Agency Canal		306 Acres
Upper Wind Unit		492 Acres
Johnstown Unit		190 Acres
Owl Creek Unit		245 Acres
	TOTAL	1,440 Acres

G. INDIAN FEE LAND

A total of 10,374 acres are claimed as practicably irrigable Indian fee land. The Tribes argue there are two ways to decide whether land on an Indian reservation is practicably irrigable and thus eligible for a reserved water right. The first is to compare that land to other lands and irrigation projects actually in operation in the West to determine if similar lands are being successfully irrigated. The second way is to use a formal benefit-cost analysis to determine practicability. Fairness requires that lands passing either test move closer to being held practicably irrigable.[76]

As evidence following the second test was introduced in nearly all instances, I need not consider the merits of the Tribes' test of similar land. In the one instance where the

76. Tribes' Brief, p. 16.

first test might have been persuasive as to the Indian owned fee lands claimed potentially irrigable, I find the Tribes failed to make out even a minimal case of practicable irrigability, or that those acres had any actual proof of being successfully irrigated.

Just as I cannot accept as totally credible Mr. Sostrom's testimony in areas in which he was not an expert, neither can I give complete credibility to Mr. Higginson's broad assertions of land similarity as evidence of practicably irrigable acreage. Although one of the nation's outstanding engineers and an admitted expert in water resources engineering, Mr. Higginson was not tendered nor accepted as an expert in soils science, agricultural engineering or economics. Yet he was asked to combine all these fields in making his conclusions with respect to the "potentially" irrigable Indian owned fee lands. His professional definition of irrigable land was land that is of a soil type and texture and the slopes are such, and it is within reasonable proximity to a water source, that with a usual amount of effort water could be brought to the land and it could grow agricultural crops.[77] While an erudite definition, it alone can hardly be the basis for an award of practicably irrigable acres.

On direct examination, though he testified that certainly economics and design are part of the determination of whether lands can be irrigated,[78] he admitted he made no economic inquiry regarding the lands to determine their similarity to those irrigated. He said he believed such economic and design analysis was part of the documents he reviewed. Though he considered alkaline soils to be practicably irrigable, he made no

77. Tr. p. 8053.
78. Tr. p. 8054.

analysis as to the costs or extent of the amendments he felt would be required. Additionally, he made no determination as to whether solving drainage problems on certain parcels was within the economic production capability of that land.[79] His assumptions as to the inclusion of these types of analysis in the soils classifications of the documents he reviewed was not supported on the record, and I find his opinion, in comparison with the questions it raises, does not support the claim for "potentially" irrigable acres. A parcel by parcel analysis by this criteria results in 3,943 acres disallowed and deleted from the 10,374 acres claimed in this category, as set forth in the following tables.

Additionally, Mr. Sommers for the State pointed out that 276 acres of Indian fee land had been noted by the United States classifiers either as nonarable Class 6 or subirrigated land. For the same reason I disallowed this acreage in the adjudicated and the unadjudicated in-use claims, I find it should be eliminated from the acreage claimed by the Tribes on behalf of individual Indians. Where Mr. Sommers has noted an appropriate deletion and Mr. Higginson classified some of that land potentially irrigable, the deletion is made first from the potentially irrigable acreage figures and then from the acreage actually irrigated. This occurred in two cases, parcels numbered 16 and 119, and they are shown along with the deletions discussed above.

79. Tr. pp. 8053, 8220 and 8237.

INDIAN FEE ACREAGE DELETIONS

	Higginson's Potentially Irrigable Classification (Acres)	Plaintiff's Exhibit SS-1003 Sommers (Acres)	Disallowed Total (Acres)
WIND RIVER BASIN			
Main Stem Wind River:			
Parcel 5	311	----	311
Parcel 6	59	----	59
Parcel 8	71	----	71
Parcel 9	350	----	350
Parcel 11	172	----	172
Parcel 12	82	----	82
Parcel 13	115	----	115
Parcel 14	169	----	169
Parcel 18	21	----	21
Parcel 29	37	----	37
Parcel 30	84	----	84
Parcel 31	94	----	94
Parcel 32	57	----	57
Parcel 34	50	----	50
Parcel 37	61	----	61
Parcel 54	286	----	286
Parcel 64	6	----	6
Parcel 66	52	----	52
Parcel 67	8	----	8
Parcel 69	80	----	80
Parcel 88	100	----	100
Parcel 91	153	----	153
Parcel 96	80	----	80
Parcel 97	80	----	80
Parcel 101	20	----	20
Parcel 104	45	----	45
Parcel 106	9	----	9
Parcel 108	35	----	35
Parcel 110	200	----	200
Parcel 112	25	----	25
Subtotal	2,912	----	2,912
Dry Creek:			
Parcel 53	293	----	293
Parcel 61	----	25	25
Parcel 62	19	----	19
Parcel 102	----	2	2
Subtotal	312	27	339

	Higginson's Potentially Irrigable Classification (Acres)	Plaintiff's Exhibit SS-1003 Sommers (Acres)	Disallowed Total (Acres)
Meadow Creek:			
Parcel 21	----	10	10
Subtotal	----	10	10
Willow Creek:			
Parcel 86	----	41	41
Subtotal	----	41	41
WIND RIVER BASIN TOTAL	3,224	78	3,302
LITTLE WIND RIVER BASIN			
Little Wind River			
Main Stem:			
Parcel 16	12	8	20
Parcel 28	17	----	17
Parcel 41	25	----	25
Parcel 57	9	----	9
Parcel 58	----	56	56
Parcel 70	49	----	49
Parcel 74	29	----	29
Parcel 75	30	----	30
Parcel 95	20	----	20
Parcel 124	17	----	17
Subtotal	208	64	272
North Fork Little Wind River:			
Parcel 48	----	10	10
Parcel 59	36	----	36
Parcel 93	----	40	40
Subtotal	36	50	86
South Fork Little Wind River:			
Parcel 27	7	----	7
Parcel 82	----	11	11
Subtotal	7	11	18
Sage Creek:			
Parcel 116	202	----	202
Parcel 119	10	73	83
Subtotal	212	73	285
LITTLE WIND RIVER BASIN TOTAL	463	198	661

	Higginson's Potentially Irrigable Classification (Acres)	Plaintiff's Exhibit SS-1003 Sommers (Acres)	Disallowed Total (Acres)
BIG HORN RIVER BASIN			
Dry Muddy Creek:			
Parcel 4	41	----	41
Subtotal	41	----	41
Maverick Springs Draw:			
Parcel 7	32	----	32
Parcel 103	5	----	5
Subtotal	37	----	37
Roundup or Warm Springs:			
Parcel 19	22	----	22
Subtotal	22	----	22
BIG HORN RIVER BASIN TOTAL	100	----	100
POPO AGIE RIVER BASIN			
Popo Agie River:			
Parcel 114	20	----	20
Subtotal	20	----	20
POPO AGIE RIVER BASIN TOTAL	20	----	20
OWL CREEK BASIN			
Red Creek and Springs:			
Parcel 17	104	----	104
Subtotal	104	----	104
Owl Creek:			
Parcel 100	32	----	32
Subtotal	32	----	32
OWL CREEK BASIN TOTAL	136	----	136
TOTAL DELETIONS	3,943	276	4,219

I therefore find that the 10,374 acres claimed by the Tribes as a measure of the reserved water right based upon individually owned Indian fee lands should be reduced by 4,219 acres to an award of 6,155 acres as the measure, summarized as follows:

Wind River Basin	4,350 Acres
Little Wind River Basin	1,325 Acres
Bighorn River Basin	35 Acres
Popo Agie River Basin	0 Acres
Owl Creek Basin	445 Acres
TOTAL	6,155 Acres

H. DIVERSION REQUIREMENT AND SUMMARY ON HISTORIC CLAIMS

I note with concern the disparity between the diversion requirements developed by Dr. Mesghinna for the Type VIII lands and Mr. Higginson for the Indian fee lands, on the one hand, and the diversion requirements developed by Mr. Stetson for the remainder of the historic lands. After review of the evidence, a discussion of which follows, I find that the Mesghinna and Higginson figures are more in line with what is reasonable and with how this water should be managed. I find that an overall efficiency increase to 40% on the historic lands should be used to measure the reserved water right. The water duties for those lands, and thus the diversion requirements in acre-feet per acre annually, are correspondingly adjusted.

Thomas Stetson, president of Stetson Engineers, testified as an expert on behalf of the United States. His testimony concerned, among other things, water duties and diversion requirements. Initially he reviewed historic diversions, devel-

oped cropping patterns according to climate stations, and used the resulting consumptive use determinations to develop net irrigation requirements for historic lands. Stetson Engineers developed a water duty schedule for the future projects and historic lands[80] which shows a water duty significantly higher in most instances than that developed by Mr. Higginson for lands in the same area.

In his review, Mr. Stetson noted that the range of efficiencies within the Federal Irrigation Projects ranged from 16.2% on the Upper Wind Unit to 39.5% on the Sub Agency Unit, for an average of 34.7% or 35%.[81] He used Dr. Mesghinna's range of efficiencies on the non-project lands, a general range of 29% to 37%, and again averaged to 35% overall.

Based on his review, it was Stetson's opinion that a 35% overall efficiency rate was achievable.[82] It was also his opinion that achieving better efficiency doesn't really involve a large cost investment, but sometimes involves simply better management to achieve that 35% figure.[83]

Keith Higginson for the Tribes developed his diversion requirement figures in much the same way as did Tom Stetson for the United States. Initially he gathered information on

---

80. United States Exhibit 306.
81. The agreed formula for the determination of annual diversion requirement is:

$$\frac{\text{Net Irrigation Requirement (NIR)}}{\text{[divided by] Overall Efficiency}} = \text{Annual Diversion Requirement}$$

Thus, the higher overall efficiency, the lower annual diversion.
82. Tr. pp. 5237-39.
83. Tr. p. 5490.

historic crop growth in the area from the BIA, USBR and other consultants in this case. He then developed a cropping pattern for the Reservation,[84] dividing the Reservation into upper and lower areas. He also relied upon information from the National Weather Service and from the State of Wyoming Planning Report No. 5, as well as weather information from stations at Dubois, Diversion Dam, Fort Washakie and Riverton.

After a review of the available published reports, Mr. Higginson agreed with Mr. Stetson's historic efficiency estimate of 35%. He felt that the use of sprinkler irrigation would improve such efficiency, but not much above 40%. He took the irrigation requirement he had calculated and divided it by the 35% efficiency figure to determine the diversion requirement. For the lower area he found this requirement to be 4.75 acre-feet per acre for gravity irrigation and 4.15 acre-feet per acre for sprinkler irrigation. In the upper area, these figures were 4.36 acre-feet per acre for gravity irrigation and 3.81 acre-feet per acre for sprinkler irrigation.

Mr. Higginson's figures are considerably more in line with the diversion requirements developed by Dr. Mesghinna for the Type VIII lands than with Mr. Stetson's figures for the remainder of the historic lands. Dr. Mesghinna, in his initial review of historic diversion requirements, found them "high", above five acre-feet per acre in most instances.[85] In developing the diversion requirements for the Type VIII lands, he used a methodology similar to that for the future projects described in the Futures section herein, with a few exceptions. The on-farm systems were designed for hand moved sprinkler irrigation rather than side roll sprinklers as were used on the future

84. Table III, p. 10, Tribes' Exhibit No. 8.
85. Tr. p. 4676.

lands. Both HKM engineers and Dr. Mesghinna felt that almost all lands irrigable by gravity are irrigable with hand moved sprinklers. Costs were increased for this method of irrigation, and operation and maintenance costs were increased by $1.00 per acre. No provision was made for canals and related structures, as the Type VIII lands are located within areas of existing diversion works.[86]

Water duties developed by Mr. Higginson for the Indian fee lands and Dr. Mesghinna for the Type VII lands were closer to the estimated State standard for adjudicated lands set out in Mr. Higginson's report,[87] and to that testified to by the State's expert, Floyd Bishop.[88] Mr. Stetson's figures, in most instances, were higher than 5.2 acre-feet per acre annually, the State standard for a growing season from April 15 through October 15. Mr. Stetson used a five-month growing season to compute his diversion requirements.

I suspect the high historic diversions found by Mr. Stetson and Dr. Mesghinna are higher because of an absence of strict water management. I base this suspicion on the testimony of those at the second Worland hearing. Though I agree again with Dr. Mesghinna that the acceptability of a higher water duty is based upon where the irrigated land is located and what impact such a diversion has upon the remaining water supply, I question allowing repetition of running water through the system and allowing the surplus to drain into a return point merely because it is the easier way to operate. However, neither can I concur wholeheartedly with Mr. Bishop's opinion that a 50% overall efficiency should be required of the Indians.

86. Tr. p. 5603.
87. Tribes' Exhibit No. 8, p. 14.
88. Tr. p. 13797; a maximum rate of diversion of 1 c.f.s per 70 acres over a five-month irrigation season will result.

Floyd Bishop, former Wyoming State Engineer, testified for the State that in his opinion a 50% efficiency rate was achievable. He also stated, however, that requiring a 50% efficiency ratio would hold irrigators using gravity irrigation on historic lands to a higher efficiency than irrigators of the future lands could achieve using sprinkler systems and closed pipes. He named no area in all of Wyoming where a 50% efficiency ratio has been achieved.

Part of Mr. Bishop's expertise was based upon his experience as Wyoming's State Engineer. It was his opinion that, in general, efficiencies of farmers on the Reservation today are not very good and that the historic diversion rate is excessive. Under existing circumstances, he feels a lot of water now diverted is wasted.[89] After hearing the testimony at the second Worland hearing, I cannot argue with Mr. Bishop's assertions. Their truth is obvious.

His assertion that a 50% overall efficiency rate is achievable is most likely valid, but not to be applied in one fell swoop. Mr. Bishop testified that a combination of good management, improvement of the facilities, lining of the canals and improved efficiency of on-farm application of water would be necessary to improve overall irrigation efficiency to 50%.[90] This activity obviously requires the involvement of a time factor. To observe the status quo in Water Division No. 3, and also require a 50% efficiency of Indian irrigators now, where historic efficiencies have averaged 35%, would thus be inequitable. So, after careful consideration of the evidence as noted

89. Tr, pp. 13725 and 13811.
90. Tr. p. 13810

above, I find that the water duties arrived at by Dr. Mesghinna for the Type VIII lands and by Mr. Higginson for the Indian fee lands are reasonable. I also find that an increase of 5% in the overall irrigation efficiency (to 40%) on the historic lands would not be unreasonable or overly burdensome to the irrigators there, in light of all the evidence. The award of annual diversion set forth below is therefore calculated at a 40% overall efficiency rate, as restated on the following tables which summarize the principal points.

ADJUDICATED ANALYSIS

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWAR Acre-Fe
PROJECT LANDS:							
WIND RIVER FEDERAL PROJECT							
Little Wind Unit:							
Ray Canal	347.0	14.9	332.0	5.32	4.65	1,846.0	1,5
Coolidge Canal	311.0	186.2	125.0	4.95	4.32	1,539.0	5
Sub Agency Canal	-----	-----	-----	-----	-----	-----	-
Subtotal:	658.0	201.1	457.0			3,385.0	2,0
Upper Wind Unit:							
Wind River "A" Canal	-----	-----	-----	-----	-----	-----	-
Dinwoody Canal	492.0	47.0	445.0	12.06	10.55	5,934.0	4,6
Subtotal:	492.0	47.0	445.0			5,934.0	4,6
Johnstown Unit:	-----	-----	-----	-----	-----	-----	-
Lefthand Unit:	20.0	17.0	3.0	6.90	6.03	138.0	
MIDVALE IRRIGATION DISTRICT	-----	-----	-----	-----	-----	-----	-
RIVERTON-LECLAIR DISTRICT	-----	-----	-----	-----	-----	-----	-
PROJECT LANDS SUBTOTAL	1,170.0	265.1	905.0			9,457.0	6,7

UDICATED ANALYSIS

: 2 of 3

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDED Acre-Feet/Year
-PROJECT LANDS:							
) RIVER BASIN							
st Fork Wind River	259.0	237.3	22.0	5.06	4.42	1,310.0	97.0
nwoody Creek	17.0	-----	17.0	5.57	4.85	95.0	82.0
nd Draw	-----	-----	-----	-----	-----	-----	-----
y Creek	-----	-----	-----	-----	-----	-----	-----
ll Lake Creek	-----	-----	-----	-----	-----	-----	-----
adow Creek	166.0	-----	166.0	5.43	4.75	901.0	789.0
y Pasup Creek	1,977.0	521.0	1,456.0	5.31	4.64	10,498.0	6,756.0
ow Creek	2,927.0	579.4	2,348.0	5.31	4.65	15,542.0	10,918.0
low Creek	60.0	2.0	58.0	5.57	4.87	334.0	282.0
in Stem Wind River	1,338.0	421.9	916.0	5.54	4.85	7,413.0	4,443.0
Subtotal:	6,744.0	1,761.6	4,983.0			36,093.0	23,367.0
'LE WIND RIVER SIN							
rth Fork Little Wind River	485.0	48.4	437.0	5.49	4.80	2,663.0	2,098.0
ıth Fork Little Wind River	107.0	-----	107.0	4.94	4.32	529.0	462.0
in Stem Little Wind River	-----	-----	-----	-----	-----	-----	-----
l Creek	37.0	9.0	28.0	5.57	4.85	206.0	136.0
ge Creek	207.0	50.1	157.0	5.57	4.85	1,153.0	761.0
ooked Creek	-----	-----	-----	-----	-----	-----	-----
out Creek	-----	-----	-----	-----	-----	-----	-----
ring Creek	-----	-----	-----	-----	-----	-----	-----
thorn Draw	-----	-----	-----	-----	-----	-----	-----
Subtotal:	836.0	107.5	729.0			4,551.0	3,457.0

ADJUDICATED ANALYSIS

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDED Acre-Feet/Year
BIGHORN RIVER BASIN							
Main Stem Bighorn River	100.0	72.0	28.0	5.94	5.19	594.0	145.0
Cottonwood Creek	505.0	82.7	422.0	5.89	5.15	2,794.0	2,173.0
Fivemile Creek	156.0	-----	156.0	5.57	4.87	869.0	760.0
Muddy Creek	2,901.0	750.7	2,150.0	5.43	4.75	15,752.0	10,213.0
Dry Muddy Creek	-----	-----	-----	-----	-----	-----	-----
Maverick Springs Draw	-----	-----	-----	-----	-----	-----	-----
Roundup or Warm Springs	-----	-----	-----	-----	-----	-----	-----
Subtotal:	3,662.0	905.4	2,757.0*			20,009.0	13,291.0
POPO AGIE RIVER BASIN							
North Fork Popo Agie River	320.0	48.0	272.0	5.40	4.72	1,728.0	1,284.0
Main Stem Popo Agie River	40.0	8.9	31.0	5.40	4.72	216.0	146.0
Subtotal:	360.0	56.9	303.0			1,944.0	1,430.0
OWL CREEK BASIN							
South Fork Owl Creek	1,620.0	1,002.2	618.0	5.46	4.77	8,845.0	2,948.0
Main Stem Owl Creek	2,265.0	773.7	1,491.0	5.40	4.72	12,231.0	7,038.0
Mud Creek	754.0	144.7	609.0	5.43	4.75	4,094.0	2,893.0
Red Creek	-----	-----	-----	-----	-----	-----	-----
Subtotal:	4,639.0	1,920.6	2,718.0			25,170.0	12,879.0
NON-PROJECT LANDS SUBTOTAL	16,241.0	4,752.0	11,490.0**			87,767.0	54,424.0
PROJECT AND NON-PROJECT TOTALS FOR ADJUDICATED	17,411.0	5,017.1	12,395.0			97,224.0	61,221.0

*3,662 - 905.4 = 2,756.5

**16,241.0 - 4,752.0 = 11,489.0

DJUDICATED IN-USE ANALYSIS

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDED Acre-Feet/Year
IECT LANDS:							
) RIVER FEDERAL OJECT							
tle Wind Unit:							
Ray Canal	7,782.0	668.9	7,113.0	5.32	4.65	41,400.0	33,075.0
Coolidge Canal	6,357.0	1,163.1	5,194.0	4.59	4.32	31,467.0	22,438.0
Sub Agency Canal	2,962.0	492.6	2,469.0	5.26	4.60	15,580.0	11,357.0
Subtotal:	17,101.0	2,324.6	14,776.0			88,447.0	66,870.0
per Wind Unit:							
Wind River "A" Canal	1,019.0	134.5	885.0	12.06	10.55	12,289.0	9,337.0
Dinwoody Canal	4,611.0	733.0	3,878.0	12.06	10.55	55,609.0	40,913.0
Subtotal:	5,630.0	867.5	4,763.0			67,898.0	50,250.0
nstown Unit:	465.0	38.9	426.0	6.94	6.05	3,227.0	2,577.0
thand Unit:	1,541.0	789.7	751.0	6.90	6.03	10,633.0	4,529.0
ALE IRRIGATION RICT	569.0	8.0	561.0	5.58	4.88	3,175.0	2,738.0
RTON-LECLAIR RICT	1,271.0	295.3	976.0	5.48	4.80	6,965.0	4,685.0
ECT LANDS TOTAL	26,577.0	4,324.0	22,253.0			180,345.0	131,649.0

UNADJUDICATED IN-USE ANALYSIS

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARD Acre-Feet
NON-PROJECT LANDS:							
WIND RIVER BASIN							
East Fork Wind River	10.0	-----	10.0	5.06	4.42	51.0	44
Dinwoody Creek	154.0	36.9	117.0	5.57	4.85	858.0	567
Sand Draw	-----	-----	-----	-----	-----	-----	---
Dry Creek	183.0	113.9	69.0	5.54	4.84	1,014.0	334
Bull Lake Creek	26.0	-----	26.0	5.40	4.72	140.0	123
Meadow Creek	179.0	3.5	176.0	5.51	4.82	986.0	848
Dry Pasup Creek	56.0	-----	56.0	5.20	4.55	291.0	255
Crow Creek	36.0	1.7	34.0	5.40	4.72	194.0	160
Willow Creek	7.0	6.5	1.0	5.06	4.42	35.0	4
Main Stem Wind River	487.0	7.6	479.0	5.77	5.02	2,810.0	2,405
Subtotal:	1,138.0	170.1	968.0			6,379.0	4,740
LITTLE WIND RIVER BASIN							
North Fork Little Wind River	1,776.0	978.7	797.0	5.14	4.49	9,129.0	3,575
South Fork Little Wind River	781.0	256.4	525.0	5.11	4.47	3,991.0	2,347
Main Stem Little Wind River	386.0	-----	386.0	5.94	5.19	2,293.0	2,003
Mill Creek	-----	-----	-----	-----	-----	-----	---
Sage Creek	776.0	27.4	749.0	5.51	4.82	4,276.0	3,611
Crooked Creek	69.0	-----	69.0	5.26	4.60	363.0	317
Trout Creek	228.0	-----	228.0	5.46	4.77	1,245.0	1,087
Spring Creek	178.0	-----	178.0	4.97	4.34	885.0	773
Bighorn Draw	139.0	-----	139.0	4.94	4.32	687.0	601
Subtotal:	4,333.0	1,262.5	3,071.0			22,869.0	14,317

UNADJUDICATED IN-USE ANALYSIS

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDED Acre-Feet/Year
BIGHORN RIVER BASIN							
Main Stem Bighorn River	2.0	-----	2.0	5.94	5.19	12.0	10.0
Cottonwood Creek	320.0	122.0	198.0	5.89	5.15	1,885.0	1,020.0
Fivemile Creek	362.0	95.3	267.0	5.57	4.85	2,016.0	1,295.0
Muddy Creek	1,194.0	234.7	959.0	5.60	4.90	6,686.0	4,699.0
Dry Muddy Creek	-----	-----	-----	-----	-----	-----	-----
Maverick Springs Draw	-----	-----	-----	-----	-----	-----	-----
Roundup or Warm Springs	-----	-----	-----	-----	-----	-----	-----
Subtotal:	1,878.0	452.0	1,426.0			10,599.0	7,024.0
POPO AGIE RIVER BASIN							
North Fork Popo Agie River	112.0	-----	112.0	5.43	4.75	608.0	532.0
Main Stem Popo Agie River	74.0	34.3	40.0	5.74	5.02	425.0	201.0
Subtotal:	186.0	34.3	152.0			1,033.0	733.0
OWL CREEK BASIN							
South Fork Owl Creek	84.0	-----	84.0	5.51	4.82	463.0	405.0
Main Stem							
Owl Creek	46.0	-----	46.0	5.40	4.72	248.0	217.0
Mud Creek	185.0	55.6	129.0	5.29	4.62	979.0	596.0
Red Creek	-----	-----	-----	-----	-----	-----	-----
Subtotal:	315.0	55.6	259.0			1,690.0	1,218.0
NON-PROJECT LANDS SUBTOTAL	7,850.0	1,974.5	5,876.0			42,570.0	28,032.0
PROJECT AND NON-PROJECT TOTALS FOR ADJUDICATED IN-USE	34,427.0	6,298.5	28,129.0			222,915.0	159,681.0

TYPE VII ANALYSIS

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDE Acre-Feet/
PROJECT LANDS:							
WIND RIVER FEDERAL PROJECT							
Little Wind Unit:							
Ray Canal	1,769.0	514.4	1,255.0	5.32	4.65	9,411.0	5,836.
Coolidge Canal	1,161.0	233.7	927.0	4.95	4.32	5,747.0	4,005.
Sub Agency Canal	200.0	16.9	183.0	5.26	4.60	1,052.0	842.
Subtotal:	3,130.0	765.0	2,365.0			16,210.0	10,683.
Upper Wind Unit:							
Wind River "A" Canal	99.0	39.6	59.0	12.06	10.55	1,194.0	622.
Dinwoody Canal	393.0	-----	393.0	12.06	10.55	4,738.0	4,146.
Subtotal:	492.0	39.6	452.0			5,932.0	4,768.
Johnstown Unit:	189.0	138.0	51.0	6.94	6.05	1,312.0	309.
Lefthand Unit:	587.0	136.2	451.0	6.90	6.03	4,050.0	2,720.
MIDVALE IRRIGATION DISTRICT	-----	-----	-----	-----	-----	-----	----
RIVERTON-LECLAIR DISTRICT	100.0	9.6	90.0	5.48	4.80	548.0	432.
PROJECT LANDS SUBTOTAL	4,498.0	1,088.4	3,410.0***			28,052.0	18,912.

***4,498.0 - 1,088.4 = 3,409.6

VII ANALYSIS

2 of 3

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDED Acre-Feet/Year
PROJECT LANDS:							
RIVER BASIN							
t Fork Wind River	41.0	41.0	-----	5.06	4.42	207.0	-----
woody Creek	-----	-----	-----	-----	-----	-----	-----
d Draw	-----	-----	-----	-----	-----	-----	-----
Creek	4.0	3.5	1.0	5.57	4.85	22.0	5.0
l Lake Creek	37.0	-----	37.0	5.37	4.67	199.0	173.0
dow Creek	160.0	-----	160.0	5.09	4.45	814.0	712.0
Pasup Creek	115.0	77.2	38.0	5.06	4.42	581.0	168.0
w Creek	154.0	31.1	123.0	5.29	4.62	815.0	568.0
ow Creek	-----	-----	-----	-----	-----	-----	-----
n Stem Wind River	213.0	-----	213.0	5.51	4.82	1,174.0	1,027.0
Subtotal:	724.0	152.8	572.0			3,812.0	2,653.0
E WIND RIVER SIN							
th Fork Little ind River	357.0	159.1	198.0	5.51	4.82	1,795.0	873.0
th Fork Little ind River	44.0	15.3	29.0	5.09	4.45	224.0	129.0
n Stem Little ind River	805.0	95.5	710.0	5.94	5.19	4,782.0	3,685.0
Creek	10.0	9.7	-----	5.57	4.85	56.0	-----
e Creek	822.0	-----	822.0	5.57	4.85	4,579.0	3,987.0
oked Creek	3.0	2.6	-----	5.57	4.85	17.0	-----
ut Creek	63.0	63.0	-----	5.11	4.47	322.0	-----
ing Creek	-----	-----	-----	-----	-----	-----	-----
horn Draw	-----	-----	-----	-----	-----	-----	-----
Subtotal:	2,104.0	345.2	1,759.0			11,775.0	8,755.0

TYPE VII ANALYSIS

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDED Acre-Feet/Year
BIGHORN RIVER BASIN							
Main Stem Bighorn River	24.0	-----	24.0	5.94	5.19	143.0	125.0
Cottonwood Creek	117.0	47.7	69.0	5.89	5.15	689.0	355.0
Fivemile Creek	-----	-----	-----	-----	-----	-----	-----
Muddy Creek	186.0	1.9	184.0	5.63	4.93	1,047.0	907.0
Dry Muddy Creek	-----	-----	-----	-----	-----	-----	-----
Maverick Springs Draw	-----	-----	-----	-----	-----	-----	-----
Roundup or Warm Springs	-----	-----	-----	-----	-----	-----	-----
Subtotal:	327.0	49.6	277.0			1,879.0	1,387.0
POPO AGIE RIVER BASIN							
North Fork Popo Agie River	102.0	14.1	88.0	5.40	4.72	551.0	415.0
Main Stem Popo Agie River	-----	-----	-----	-----	-----	-----	-----
Subtotal:	102.0	14.1	88.0			551.0	415.0
OWL CREEK BASIN							
South Fork Owl Creek	64.0	12.9	51.0	5.57	4.85	356.0	247.0
Main Stem Owl Creek	87.0	-----	87.0	5.37	4.67	467.0	406.0
Mud Creek	40.0	11.9	28.0	5.37	4.67	215.0	131.0
Red Creek	-----	-----	-----	-----	-----	-----	-----
Subtotal:	191.0	24.8	166.0			1,038.0	784.0
NON-PROJECT LANDS SUBTOTAL	3,448.0	586.5	2,862.0****			19,055.0	13,994.0
PROJECT AND NON-PROJECT TOTALS FOR TYPE VII	7,946.0	1,674.9	6,271.0			47,107.0	32,906.0

****3,448 - 586.5 = 2,862.0

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	CLAIMED WATER DUTY Acre-Foot/Acre	AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDED Acre-Feet/Year
JECT LANDS:							
D RIVER FEDERAL OJECT							
ttle Wind Unit:							
Ray Canal	28.0	-----	28.0	-----	-----	118.0	118.0
Coolidge Canal	200.0	21.0	179.0	5.01	5.01	1,001.0	897.0
Sub Agency Canal	306.0	-----	306.0	-----	-----	1,531.0	1,531.0
Subtotal:	534.0	21.0	513.0			2,650.0	2,546.0
per Wind Unit:	492.0	-----	492.0	-----	-----	2,056.0	2,056.0
Wind River "A" Canal	-----	-----	-----	-----	-----	-----	-----
Dinwoody Canal	-----	-----	-----	-----	-----	-----	-----
Subtotal:	492.0		492.0			2,056.0	2,056.0
hnstown Unit:	190.0	-----	190.0	-----	-----	951.0	951.0
fthand Unit:	-----	-----	-----	-----	-----	-----	-----
VALE IRRIGATION TRICT	-----	-----	-----	-----	-----	-----	-----
ERTON-LECLAIR TRICT	-----	-----	-----	-----	-----	-----	-----
JECT LANDS BTOTAL	1,216.0	21.0	1,195.0			5,657.0	5,553.0
CREEK FUTURE OJECT	245.0	-----	245.0	-----	-----	855.0	855.0
JECT AND OWL EEK FUTURE OJECT TOTALS FOR TYPE VIII	1,461.0	21.0	1,440.0			6,512.0	6,408.0

INDIAN FEE ANALYSIS

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARI Acre-Fee
NON-PROJECT LANDS:							
WIND RIVER BASIN							
East Fork Wind River	-----	-----	-----	-----	-----	-----	--
Dinwoody Creek	-----	-----	-----	-----	-----	-----	--
Sand Draw	-----	-----	-----	-----	-----	-----	--
Dry Creek	1,552.0	349.0	1,203.0	various	various	6,705.0	5,24
Bull Lake Creek	-----	-----	-----	-----	-----	-----	--
Meadow Creek	178.0	10.0	168.0	various	various	776.0	73
Dry Pasup Creek	-----	-----	-----	-----	-----	-----	--
Crow Creek	-----	-----	-----	-----	-----	-----	--
Willow Creek	176.0	41.0	135.0	various	various	767.0	59
Main Stem Wind River	5,746.0	2,912.0	2,834.0	various	various	25,588.0	12,96
Subtotal:	7,652.0	3,312.0	4,340.0			33,836.0	19,53
LITTLE WIND RIVER BASIN							
North Fork Little Wind River	366.0	86.0	280.0	various	various	1,738.0	1,33
South Fork Little Wind River	470.0	18.0	452.0	various	various	2,233.0	2,14
Main Stem Little Wind River	796.0	272.0	524.0	various	various	3,781.0	2,48
Mill Creek	-----	-----	-----	-----	-----	-----	--
Sage Creek	354.0	285.0	69.0	various	various	1,682.0	32
Crooked Creek	-----	-----	-----	-----	-----	-----	--
Trout Creek	-----	-----	-----	-----	-----	-----	--
Spring Creek	-----	-----	-----	-----	-----	-----	--
Bighorn Draw	-----	-----	-----	-----	-----	-----	--
Subtotal:	1,986.0	661.0	1,325.0			9,434.0	6,29

SOURCE	CLAIMED ACRES	DELETED ACRES	AWARDED ACRES	35% Overall Efficiency CLAIMED WATER DUTY Acre-Foot/Acre	40% Overall Efficiency AWARDED WATER DUTY Acre-Foot/Acre	CLAIMED Acre-Feet/Year	AWARDED Acre-Feet/Year
BIGHORN RIVER BASIN							
Main Stem Bighorn River	-----	-----	-----	-----	-----	-----	-----
Cottonwood Creek	-----	-----	-----	-----	-----	-----	-----
Fivemile Creek	-----	-----	-----	-----	-----	-----	-----
Muddy Creek	-----	-----	-----	-----	-----	-----	-----
Dry Muddy Creek	-----	-----	-----	-----	-----	195.0	-----
Maverick Springs Draw	-----	-----	-----	-----	-----	176.0	-----
Roundup or Warm Springs	135.0	100.0	35.0	various	various	249.0	153.0
Subtotal:	135.0	100.0	35.0			620.0	153.0
POPO AGIE RIVER BASIN							
North Fork Popo Agie River	-----	-----	-----	-----	-----	-----	-----
Main Stem Popo Agie River	20.0	20.0	-----	various	various	95.0	-----
Subtotal:	20.0	20.0	-----			95.0	-----
OWL CREEK BASIN							
South Fork Owl Creek	-----	-----	-----	-----	-----	-----	-----
Main Stem Owl Creek	477.0	32.0	445.0	various	various	2,266.0	2,114.0
Mud Creek	-----	-----	-----	-----	-----	-----	-----
Red Creek	104.0	104.0	-----	various	various	453.0	-----
Subtotal:	581.0	136.0	445.0			2,719.0	2,114.0
NON-PROJECT LANDS SUBTOTAL	10,374.0	4,229.0	6,145.0			46,704.0	28,095.0
NON-PROJECT TOTALS FOR INDIAN FEE	10,374.0	4,229.0	6,145.0			46,704.0	28,095.0

RECAPITULATION OF TOTALS FROM PRECEDING TABLES

HISTORIC LANDS CATEGORY	ACRES			ANNUAL DIVERSION	
	NET CLAIMED	DISALLOWED	AWARDED	CLAIMED ACRE-FEET	AWARDED ACRE-FEET
ADJUDICATED	17,411.0	5,017.1	12,395.0	97,224.0	61,221.0
UNADJUDICATED IN-USE	34,427.0	6,298.5	28,129.0	222,915.0	159,681.0
TYPE VII	7,946.0	1,674.9	6,271.0	47,107.0	32,906.0
TYPE VIII	1,461.0	21.0	1,440.0	6,512.0	6,408.0
INDIAN FEE	10,374.0	4,229.0	6,145.0	46,704.0	28,095.0
TOTALS	71,619.0	17,230.5	54,390.0	420,462.0	288,355.0

II. THE DETERMINATION OF PRACTICABLY IRRIGABLE ACRES ON THE RESERVATION'S FUTURE LANDS

A. INTRODUCTION

The United States and the Tribes seek a substantial amount of water in their reserved water rights claim for the irrigation of land not before irrigated, but which is claimed to be practicably irrigable. That claim, labeled for convenience as the "future lands" in this proceeding by the parties, relies on the ruling in Arizona v. California for Supreme Court precedence. The Supreme Court concluded in that case, "...that the only feasible and fair way by which reserved water for the Reservations can be measured is irrigable acreage."[1] The Court agreed with the Special Master that the reservation of water was intended to satisfy the future needs of the Indians as well as the present needs and granted sufficient water to irrigate future projects constructed on practicably irrigable acreage.[2] The State of Wyoming renewed its position that no reserved right exists, but alternatively maintains the amount of

1. Arizona v. California, 373 U.S. 546 at 601, 10 L.Ed.2 542 at 578, 83 S.Ct. 1468 (1963).
2. See also the the opening statement of the Boundaries and Dates section, supra, for a restatement of this law by Elbert P. Tuttle, Special Master in the subsequent Arizona v. California case.

practicably irrigable acreage on the Reservation is significantly less that the amount claimed by the United States.

The procedure used to express quantification has been varied throughout the pleadings and evidence. In its original Statement of Claims, the United States sets out the claims by source of water, arriving at over 88,000 practicably irrigable acres and a claim of 308,000 acre-feet of water per year.[3] Study areas of arable acres were further trimmed to 76,027 for the final projects. As evidence was addressed by the several federal experts, acreage and water requirements were further reduced during trial. In their final form they appeared as about 53,760 acres for the five projects, with a total annual diversion requirement of about 210,000 acre-feet.

A majority of the evidence presented sets forth the figures as they are broken down into the various study areas created by the experts for the United States as well as certain parcels of land located near Federal irrigation projects and referred to as Type VIII lands. For the sake of consistency, I will discuss the future lands by reference to the study areas.

The Wind River Indian Reservation consists of approximately 2½ million acres[4] and has a variety of geographical features ranging from rocky, near arid conditions, to land quite suitable for sustained crop production. The surface deposits come from the alluvium and sands, gravels and clays from the major rivers and streams.[5] The topography of the Reservation ranges from nearly level terraces to steep mountain slopes and rolling hills.[6] Elevations on the Reservation also vary, ranging

3. United States' Statement of Claim, pp. 1-2.
4. Tr. p. 1208.
5. Tr. p. 760.
6. United States Exhibit WRIRC-43, p. 1.

from 4,600 feet at Boysen Dam to about 13,800 feet on Gannett Peak. The average elevation of the central low lands is from 5,000 to 6,500 feet.[7] This vast, diverse eco-system provides the setting for the discussion for practicably irrigable acres.

B. TEST FOR PRACTICABLY IRRIGABLE ACRES

The Supreme Court in Arizona v. California ruled that a reserved right exists for all land which is "practicably irrigable", but offered no test or guidance to help determine what is a practicably irrigable acre, often referred to as a PIA. The term PIA is legal in derivation rather than an engineering concept[8] and has no uniformly accepted definition. In this lawsuit, one definition has been used and agreed upon by counsel for the State, the United States and the Tribes. Practicably irrigable acres are "those acres susceptible to sustained irrigation at reasonable costs".[9] That definition will be the one applied in this Report in determining the quantification of the reserved right.

The test for practicably irrigable acreage requires a two part analysis. First, the land in question must be susceptible to sustained irrigation. That determination is reached only after a consideration of several factors. The United States included soil analysis, drainage investigation, topographical and geological considerations, climate data, water availability determination, cropping patterns, and irrigation system designs in its attempt to establish susceptibility of sustained irrigation. The State, while disagreeing with certain approaches of, or

7. United States Exhibit WRIRC-43, p. 2.
8. Tr. p. 1293; Tr. p. 4351, et seq.
9. Tr. p. 13360.

applications made by, the United States, followed a similar approach.

The second part of the analysis requires a determination that the irrigation be accomplished "at reasonable cost." The parties have interpreted this part of the definition to be an economic feasibility criteria and presented substantial economic evidence to support their positions. Virtually no other aspect of this litigation has prompted more debate among the parties and more complex, divergent testimony and evidence than the question of economic feasibility and its benefit-cost ratio and discount rate components.

1. Present Standards

Wyoming raised the question of the appropriate date - not before 1905 - from which to measure feasibility, or practicability, of irrigation. My reading of Arizona v. California supports the view that evidence of "practicable irrigability" was determined by then current standards. Judge Elbert P. Tuttle, Special Master in the 1982 re-hearing, concludes that "the determination of practicable irrigability should be based on present standards. Reference to past standards would introduce an additional complication in an already complex case."[10] I agree and find accordingly.

C. ARABILITY

The United States defined "arable" as those lands which are capable of sustained irrigation[11] or which can "sustain

10. Report of Elbert P. Tuttle, Special Master to the Supreme Court in Arizona v. California, February 22, 1982, p. 98.
11. United States Exhibit WRIRC-43, p. 28.

long-term irrigation."[12] The State of Wyoming took exception to this definition, contending that a "tract specific" analysis of relevant economic factors needed to be made at the arability determination stage.[13] Economics is obviously a critical, necessary factor which must be considered in reaching a determination of practicably irrigable acreage. But that analysis is best left for the expert economists to consider and when the second half of the practicably irrigable test is applied. Injecting economics into the arability question, as long as it is covered elsewhere, is an unnecessary duplication of effort. Therefore, I believe the criteria established by the United States is appropriate.

The case for arability presented by the United States relied upon facts and data compiled and collected by its experts from a variety of sources. Results from previous soil investigations by the Bureau of Indian Affairs, the Bureau of Reclamation (also known as the Water and Power Resources Service), and the Soil Conservation Service were considered, as well as new data compiled by the United States' experts for this litigation.[14]

The State of Wyoming also relied on previous investigations, as well as an analysis of the United States' experts' data and its own investigation.[15] From the materials gathered, the United States reduced the land base of the Reservation still under consideration to approximately 490,000 acres[16] and developed six study areas.[17] Those study areas as defined by the

12. Tr. p. 1295.
13. Tr. p. 10822.
14. United States Exhibit WRIRC-43, pp. 3-4; Tr. p. 1119.
15. Tr. p. 10793.
16. Tr. p. 1123.
17. United States Exhibit WRIRC-34.

United States were used, as mentioned earlier, as a common point of reference by the State and the Tribes, with the Tribes adding two additional areas for consideration.[18]

The study areas were selected by applying to the Reservation lands five land capability criteria, and a range of limiting factors for each characteristic. They are as follows:

1. Depth to barrier.
2. Water holding capacity.
3. Permeability.
4. Slope.
5. Texture.[19]

This application did not constitute a detailed study of the areas, but merely served as a screening process to arrive at the study areas. It is not necessary to devote much discussion to this stage of the analysis, since the land excluded (with the exception of Stagner Ridge and Big Horn Flats Extension study areas) is excluded by the parties and the land included is still subject to further reduction by various experts for several reasons. I, therefore, accepted the study areas proposed by the United States, together with the additions of the Tribes, as the land base for the determination of arability.

The next step in determining arability is to adopt a set of land classification specifications and apply them to the study areas to establish the arable land base. The United States proposed six classes into which the lands of the study areas would be divided, with specific standards applicable to each class. The following is a brief discussion of the classes:[20]

18. Amended Statement of the Shoshone and Arapahoe Tribes concerning the measurement of Tribal reserved water rights, filed July 20, 1982, p. 1.
19. United States Exhibit WRIRC-34, p. 7, Table I.
20. United States Exhibit WRIRC-43, pp. 8-9; see also Tr. p. 1133.

Class 1: Class 1 lands are of high quality for irrigation, and will yield high returns with minimum production and management costs.

Class 2: Class 2 lands are good quality with only minor deficiencies.

Class 3: Class 3 consists of fair quality lands having more serious deficiencies than Class 2 lands.

Class 4: Class 4 lands are of marginal quality for irrigation and are used mainly for shallow-rooted crops or pasture.

Class 5: Class 5 lands are those lands which have been placed into a deferred status pending further investigation. There were no lands included in a deferred status.

Class 6: Class 6 lands do not meet the minimum requirements for arability under the land classification standards used.

The State of Wyoming disagreed with the above class definitions, again for the reason that they do not consider economic factors and additionally that they are not specific enough. It must be admitted that the above definitions are general and do not embody a great deal of specifics. But that does not detract from their usefulness as a means of categorizing the relative merits of the lands. Furthermore, specific criteria were applied by the United States to the lands when the classifications were made. Separating lands into classes is at best a subjective undertaking, one which will always raise the possibility of disagreement among experts in the field of land classification, which does not profess to be an exact science. The classifications above provide a sufficient means whereby lands with similar characteristics can be segregated into the same class with a reasonable degree of consistency and objectivity.

The process of assigning a classification to a tract of land requires the application of a variety of standards and criteria and the expertise from a diversity of disciplines. Factors considered by the United States include soil texture, depth, moisture retention, alkalinity, salinity, surface gravel and cobble, slope, irrigation pattern and field size, level of the surface, surface cover, drainage, hydraulic conductivity and soil depth to barrier.[21] The final determination relied on input from agricultural engineers, a land classifier, a soil scientist and a drainage engineer.[22]

The State again contended that the standards adopted and criteria applied were too general and ambiguous to form a basis from which an objective evaluation could be made of the lands. Phrases such as "relatively free," "slightly irregular," and "slight drainage problem," were argued to be incapable of precise scientific determination. While it is difficult to disagree with the intent of the State's position, it is equally difficult to believe that the argument raises any substantive doubt about the standards used and the applications made by the United States in reaching its arability determination. The history of irrigation projects in the West has numerous examples of classification standards designed for specific projects which vary in degree of intensity and approach to definitions. The argument over the wording of the definitions is a semantic one as long as there is an assurance that a good, professional job was done in the field when the lands were physically analyzed and grouped into the six classes.

When the discussion turns to the actual classification field work, it raises the issue argued several times during the hear-

21. United States Exhibit WRIRC-43, Table II, pp. 10-12.
22. Tr. p. 1127.

ings of what expertise is required and how much work is sufficient to conclude that a competent job has been done. The United States relied on land classifiers who had collectively more than 96 years of experience in the field.[23] Drillings and tests included augering and logging 197 borings between 5 and 10 feet, and 357 borings of 5 feet or less; digging 9 backhoe pits; drilling and logging 117 deep holes; analyzing samples from 165 holes for soil chemistry; and running 11 infiltration and 22 hydraulic conductivity tests.[24] Additionally, information collected during the 1961 Bureau of Reclamation Study was used.

Experts for the State of Wyoming testified that the work done by the United States was not sufficient to reach the conclusions made. They contended that the complexity of the soils which comprise the Reservation require a more extensive study, with more backhoe pits and more holes.[25] The absence of logged holes for 8,909 acres of gravity land and 11,143 acres of sprinkler land was argued as showing that the study was incomplete.[26] The State placed a tremendous importance throughout the cross-examination of the experts for the United States, as well as in its case in chief, on the fact that certain lands were classified where no hole was drilled or was not at least six feet in depth. The conclusion sought by this argument is that the land could therefore not be classified given the absence of a hole drilled to an appropriate depth.

No one would argue that the optimal land classification effort would be one where each and every plot, parcel, field

23. Tr. pp. 1154-1155.
24. United States Exhibit WRIRC-34, p. 16.
25. Tr. p. 10625.
26. Tr. p. 10935.

and tract of land had a thorough chemical analysis of the soil, several borings, deep holes and at least one backhoe pit. Thousands of hours and vast amounts of resources could be spent on such an undertaking. Even with that degree of effort, there still could be the possibility that some good land would be overlooked or that some questionable land might be included. What is involved is an area of engineering that is not an exact science and which depends on the application of experience and expertise by the classifier in the field to the given situation. The test of a land classification study must not be so minute and demanding as to exceed all realms of reasonableness.

It is possible that some error may exist in the results produced by the United States. Error is probably inevitable whenever a group of people are required to coordinate and analyze such a complex matter and must rely on a field of expertise which, by its nature, lacks the certainty of complete objectivity. But that concern can be addressed by an appropriate percentage reduction in the totals to reflect the unavoidable errors that arise in such a study. Ten or fifteen percent would be an appropriate reduction figure to use given the complexity of the Reservation lands, the understandable limitations on time and resources available in the classification, and the state of the art of land classification.

The above is not to say that I believe the approach of the United States was incorrect or incomplete. The United States met its burden of proof in establishing the land base for the determination of arability. The State of Wyoming, while certainly raising some concerns sufficient to support a percentage reduction, did not establish a case sufficient to refute the case of the United States. It is not a prerequisite, as the

State might argue, in establishing a land classification, that each and every tittle of land have a batch of borings and testings. Therefore, it is my conclusion that the preponderance of the evidence favors the arable land base proposed by the United States, with a reasonable percentage reduction to compensate for error and inaccuracy. That percentage reduction of ten to fifteen percent will be considered more carefully in the next section.

The following describes the arable lands by study area and includes a breakdown of number of acres of gravity lands, additional sprinkler lands and total arable lands:[27]

(a) North Crowheart Area

The North Crowheart Area lies north of the Wind River. Arable land is predominantly in the terrace lands paralleling Crow, Dry, Fivemile, Muddy, and Cottonwood Creeks. Surface soils of these areas are either terrace or alluvial fan material. The subsoils are mostly residual.

Gravity lands	41,985 Acres
Additional Sprinkler lands	1,105 Acres
Total Arable Lands	43,089 Acres

(b) South Crowheart Area

Lands of the South Crowheart Area are along the south side of Wind River and extend to near the confluence of Little Wind River. The core of the South Crowheart Area is an elevated terrace bench at the eastern end, where the land is

27. United States Exhibit WRIRC-43, pp. 22-25; Table 8 was used as a reference exhibit in preparing the table. Gravity lands are capable of sprinkler irrigation. Additional sprinkler lands, due to slope, will not support gravity irrigation.

gently sloping to nearly flat. Near the margins of the bench are some irregularities in slope. Soils are loams and clay loams overlying gravels. The top 12 inches of these gravels is usually in a loam or sandy loam matrix, and loose gravel is seldom encountered within 3 feet of the surface. Arable areas are small and scattered. Arable soils in this project area are generally light in texture and free of salt or sodium, and bedrock is seldom deeper than 10 feet from the surface.

Gravity lands	5,425 Acres
Additional Sprinkler lands	1,762 Acres
Total Arable Lands	7,187 Acres

(c) Big Horn Flats Area

Big Horn Flats is a series of elevated terrace benches some 17 miles in length with a maximum width of about 3 miles, lying south of and roughly parallel to the Wind River near the base of the western part of the basin. This area is a terrace remnant sloping from 6300 feet in elevation at the western end to 5800 at the eastern end. Topography is acceptable for either gravity or sprinkler irrigation. Soils are of terrace origin and overlie loose gravel at some depth. Gravel and cobble are common in a loam or clay loam matrix. Much of the bench land was limited to Class 2 and Class 3 because of the reduced water-holding capacity of the soil caused by the effect of large quantities of gravel. Backhoe pits in the area revealed roots to a depth of 60 inches showing that the gravel was not a restriction to roots or plant growth.

Gravity lands	13,677 Acres
Additional Sprinkler lands	4,004 Acres
Total Arable Lands	17,681 Acres

(d) Riverton East Area

Approximately two-thirds of the arable lands in the Riverton East project lie on low terraces of the Wind River. The land surface is smooth and favorable for irrigation. Soils of the terraces are underlain by gravel and sad. Approximately one-third of the arable areas lying on the lower ridges and slopes of the residual upland have light-textured soils and grades of 1 to 4 percent.

Gravity lands	2,902 Acres
Additional Sprinkler lands	1,321 Acres
Total Arable Lands	4,223 Acres

(e) Owl Creek Area

The Owl Creek Area is located along the northern boundary of the Reservation and includes the 'Arapahoe Ranch purchased by the Arapahoe Tribe. Arable lands are scattered and located on intermixed remnants of old gravel terraces and residual soils. South of Owl Creek, the gravel terraces containing arable lands have small, irregular fields that are too steep and undulating for gravity irrigation, though suitable for sprinkler application. The residual soils have a clay topsoil with a medium textured subsoil.

Gravity lands	0 Acres
Additional Sprinkler lands	233 Acres
Total Arable Lands	233 Acres

(f) Arapahoe Area

This area occupies land lying between the Little Wind and Popo Agie River. The main body of arable land is a terrace

bench in the confluence area between the two streams. Soils on this bench overlie gravels of varying depths.

Gravity lands	2,086 Acres
Additional Sprinkler lands	1,528 Acres
Total Arable Lands	3,614 Acres

2. Summary of Acreage Totals After Arability Test

In summary, the future areas proposed by the United States were as follows:

Project	Lands		Total Acres
	Gravity	Additional Sprinkler	
North Crowheart	41,985	1,105	43,089
South Crowheart	5,425	1,762	7,187
Big Horn Flats	13,677	4,004	17,681
Riverton East	2,902	1,321	4,223
Owl Creek	0	233	233
Arapahoe	2,086	1,528	3,614
Total	66,075	9,953	76,027

D. ENGINEERING FEASIBILITY

The next factor in the irrigability equation is the determination of the feasibility of the proposed projects from an engineering viewpoint. This aspect of the proceedings included several weeks of hearings and numerous witnesses for all major parties.

The United States, through the testimony of Dr. Mesghinna of Stetson Engineers, presented its case for the design of irrigation facilities to service the future lands projects, the costs involved and irrigation requirements. The Tribes, while relying on and adopting in part the testimony of the United

States, offered its own witnesses from Keller Engineers, advocating additional acreage labelled Stagner Ridge and Big Horn Flats Extension. The State of Wyoming, with testimony from Banner and Associates, sought to show the infeasibility of the United States' and Tribes' proposals and argued for a reduced finding of irrigable acreage.

1. The 11 Point Analysis

The engineering feasibility determination requires consideration of several factors and the application of data from a variety of sources. The testimony by Dr. Mesghinna on these factors demonstrates a thorough, professional presentation of the subject and provides an excellent basis for discussion.[28] He identified eleven factors to consider in arriving at the engineering feasibility determination. They are as follows:

1. Climate
2. Crops
3. Evapotranspiration
4. On-farm system design
5. Pipe network design
6. Pumps and pumping plants
7. Canals and related structures
8. Subsurface and maintenance
9. Operation and maintenance
10. Water duty
11. Total costs

While disagreement exists between the experts as to final conclusions or particular aspects of the analysis of each of the eleven points, most of the testimony presented regarding engineering feasibility was presented by an approach similar to the eleven point approach of Dr. Mesghinna.

28. In general, see United States Exhibit WRIRC-245; Tr. p. 4000, et seq.

The importance of climate cannot be underestimated in determining engineering feasibility because of its significant impact on cropping patterns and, therefore, all other aspects of a feasibility analysis.

(a) Climate Zones

The United States, using the criteria of elevation, area distribution, and other agency studies in the area, selected seven weather stations on or near the Reservation to compile the climate data.[29] From the information gathered, Mesghinna proposed seven climate zones: Diversion Dam; Fort Washakie; Pavillion; Burris; Riverton; DuBois; and Lander.[30] Those zones, together with the respective data for each, were then used for input on selection of crops and cropping patterns.

While the Tribes did not contest the development of the climatological data, the State of Wyoming questioned its reliability, contending it was gathered from only seven locations and therefore, was not sufficiently accurate for use over the entire Reservation. As I stated in my arability discussion, an optimum approach can be envisioned for any aspect of an analysis which, when compared to the study actually done, makes the effort appear far from complete. Climate data gathering stations could have been set up in hundreds of locations on the Reservation to get a better sampling of the variance in climate from one study area to another. Particularly detailed measurements of solar radiation could have consumed thousands of hours of work. Even with that effort, the data could be criticized for not representing the average or norm for the area for

29. Tr. pp. 4026-35.
30. United States Exhibit WRIRC-244.

a given cycle of years. This entire adjudication could have been delayed for ten years while a complete study was done for a ten year cycle.

Obviously, it is unfair to require such an unrealistic test when there is no evidence, and only speculation, that the data used by Dr. Mesghinna was unreliable or that any greater effort would produce different results. Reason and common sense, together with the inevitable restrictions of time and budget, dictate that something less than perfection should warrant the conclusion that an adequate, professional job has been done in compiling data reliable enough to use with reasonable certainty. The testimony of and the effort made by Dr. Mesghinna in compiling the climatological data satisfies any burden of the United States to prove the climate base for the engineering feasibility analysis. The State does not shift the burden back merely by asserting that greater efforts could have been made in the data collection.

(b) Cropping Patterns

The next step is the selection of crops and cropping patterns for the study areas. Dr. Mesghinna considered several factors in his selection of the crops and patterns, including climate conditions, soil characteristics, water availability, market factors, ease of transportation and demand for the products.[31] Together with assistance for economic considerations and farmer interviews to determine actual preferenees, alfalfa, corn, small grain nursing alfalfa and small grain were selected as the crops to be grown in the future projects. Dr. Mesghinna then developed cropping patterns using the selected crops,

31. United States Exhibit WRIRC-245, Tr. pp. 4045-57.

one for areas less than 5,900 feet in elevation and one for elevations of greater than 5,900 feet.[32] The lower elevation pattern consists of sixty-seven percent (67%) alfalfa, twelve percent (12%) corn, sixteen percent (16%) small grain nursing alfalfa, and five percent (5%) small grain.[33] The higher elevation pattern consist of sixty-seven percent (67%) alfalfa, sixteen percent (16%) small grain nursing alfalfa and seventeen percent (17%) small grain.

The cropping patterns selected by the United States drew relatively little reaction from other parties. The State of Wyoming contended that a different pattern could contribute to a higher overall efficiency and thereby reduce the diversion requirements. While that may be true, and without commenting on the merits of the suggestion, the patterns proposed by the United States nevertheless are realistic and do not demonstrate any significant deviation from an historically typical Wyoming farming pattern. I therefore find that the cropping patterns proposed by the United States are reasonable for use in the feasibility analysis.

(c) Evapotranspiration

The next consideration is the very complex, technical determination of the water required for the growth of the selected crops. This requires determination of "evapotranspiration", defined as the amount of water evaporated from the soil and from the plant foliage and transpirated from the plant itself.[34] First, the potential evapotranspiration of a reference

32. United States Exhibit WRIRC-245, Tr. p. 4063.
33. Tr. p. 4063.
34. Tr. p. 4066; see also United States Exhibit WRIRC-245, pp. 2-5.

crop is determined by formula. Then that result is used to calculate the evapotranspiration for the cropping patterns by multiplying the potential evapotranspiration figure by the "crop coefficient" for the crops. That result, calculated for each climatic zone for each month of the growing season, determines that amount of water necessary to meet the evapotranspiration requirements. Subtracting from that the effective precipitation that can be expected to satisfy part of the water needs leaves the net irrigation requirement, which is then applied to the cropping patterns for the two elevations.

It is unnecessary to discuss at length the various calculations and procedures outlined above and used by Dr. Mesghinna in reaching his net irrigation requirement. While there were minor differences in opinions from other experts, and questions as to how these results apply in the ultimate determination of diversion requirements, no one directly confronted the approach or findings. Mr. Bishop, as a witness for the State of Wyoming, testified that he personally would have used the Blaney-Criddle equation for calculating potential evapotranspiration rather than the Jensen-Haise formula used by Dr. Mesghinna. He admitted the decision was due in part to his familiarity with that approach, and further stated the "one isn't necessarily better than the other."[35] I find no evidence or testimony to satisfactorily rebut the testimony of and procedures used by Mesghinna in reaching his net irrigation requirement determination, and I therefore find his approach and conclusions reasonable.

The next several steps in Dr. Mesghinna's analysis cause the most disagreement between the parties and produces a sig-

35. Tr. p. 12163.

nificant divergence of expert opinion. Once he determined the net irrigation requirement, he designed the on-farm system and then the conveyance system to service the project. His designs and related cost estimates were the catalyst for opposing testimony from virtually every other witness on the subject.

It should be noted at the outset, before examining the merits of the respective positions, that Dr. Mesghinna's designs received relatively warm praise from his colleagues for their engineering feasibility. Mr. Bliesner and Dr. Keller testified respectively that the designs were "workable" and that the technology was "very, very common."[36] Mr. Bishop testified the designs were reasonably good and "The methods used were all right, in my view, and supportable."[37]

(d) On-Farm System Design, Drainage and Remaining Points

Dr. Mesghinna developed costs and designs for the on-farm system, the pipe network, pumps and pumping plants, canals and related structures, drainage, and operation and maintenance. He gave a very detailed, professional discussion and analysis of the factors involved as well as the process used in determining all the required components.[38] He admitted during his testimony in several instances that he generally took a rather conservative approach to the costing and design decisions, relying on personal experience and knowledge of the potential for cost overruns and unforeseeable problems as a basis for his professional opinion.

36. Tr. p. 8355; Tr. p. 8788.
37. Tr. p. 12157.
38. United States Exhibit WRIRC-245; Tr. p. 4106-4276.

The Tribes contend that while Dr. Mesghinna's plan was workable, it was, as testified to by Mr. Bliesner, "more expensive than necessary to accomplish the job that needed to be done."[39] Keller Engineering examined five major areas of the plan and determined with the use of alternate design features, lower unit costs, lower operating pressures, and life cycle optimizing techniques, "the investment and operating costs can be significantly reduced."[40] Specific details were given for each area of evaluation.

(e) Difference in Costing Methods

Keller Engineers testified that the pipeline costs could be reduced by as much as twenty-three percent (23%), but for a conservative estimate, they used fifteen percent (15%). This result was a product of the use of a computerized pipe network optimization program utilizing a technique developed by Dr. Keller. The program determines "the most economic system possible."[41] It also is based on lower installed material costs attributable to volume discounts allowed on large quantity purchases.

The on-farm costs and the energy costs were also reduced by the respective figures of eight percent (8%) and ten percent (10%). The on-farm reduction is again based on lower costs from large volume purchases. The energy costs were reduced by using sprinkler operating pressures ranging from 40 to 48 psi as opposed to the 55 psi figure used by Dr. Mesghinna. The trend toward improved low pressure sprinkler performance was the basis for this reduction.

39. Tr. p. 8355.
40. Tribes' Exhibit 13, p. 24.
41. Tribes' Exhibit 13, p. 9.

The pumping plant design was next criticized as being too sophisticated and elaborate for the planned need. A computer program was used here also to design cost effective pumping plants which would rely on centrifugal pumps when possible, manual rather than automatic operation, and less elaborate enclosures and related construction. Mr. Bliesner based his reductions in part on personal experience that buildings enclosing the pumping plants would not be necessary. This experience was obtained at the Superior Farming Company in California.[42] This resulted in reductions of as high as sixty percent (60%).

The drainage system design proposed by Dr. Mesghinna was claimed to be more intensive than necessary and therefore excessively expensive. Keller Engineers contend that the natural drainage capacity of the lands in the future projects was underestimated and not given sufficient weight in the drainage system design. Dr. Mesghinna's use of the admitted normal design procedure of removing all the water added during the irrigation season was labelled "the most conservative point" in his design and unnecessary for the Wind River Indian Reservation."[43] Keller Engineers' redesign of the drainage achieved approximately a twenty-seven percent (27%) reduction of Dr. Mesghinna's costs.

Dr. Mesghinna used twenty-five (25%) of all but on-farm costs for his engineering and contingency cost. Keller Engineers selected twenty percent (20%), attributing ten percent (10%) each to engineering and contingencies. The actual difference after all the computations are made is relatively small.

---

42. Tr. p. 8371.
43. Tribes' Exhibit 13, p. 31.

The greatest single criticism made by experts for the State of Wyoming against Dr. Mesghinna's design was the lack of sufficient detail to determine the elements of the design and the associated costs.[44] In general, Mr. Bishop indicated that he did not have any great problem with the overall design, and he agreed more often than not with each aspect of the plan.

Mr. Sostrom of Banner Associates, Inc. prepared and testified to costs that were developed as an estimate for the State of Wyoming of the proposed future irrigation projects.[45] Relying in part on facts and data used by Dr. Mesghinna, and developing others on his own, Mr. Sostrom reached a conclusion of per acre capital construction costs which were consistently greater than those of Dr. Mesghinna. The most apparent area of disagreement, and nearly the single reason for the disparity between the two conclusions, was the selection by Banner Associates, Inc. of thirty-five percent (35%) as the appropriate cost for engineering and contingencies.[46] The Mesghinna engineering and contingency cost figure was a constant and well defended twenty-five percent (25%).

Another factor responsible for a higher cost total is the inclusion by Mr. Sostrom of an eight percent (8%) item for mobilization. He defined mobilization costs as the "cost that is commonly used to pay for the mobilizing of the materials, the equipment, the personnel, the supervisory personnel, the on-site equipment -- or the on-site office space, all of the different pieces of work that a contractor must have available, and moving them to the job site."[47] Mr. Sostrom claimed that

44. Tr. p. 12164.
45. Plaintiff's Exhibit WRIR F50-4A.
46. Tr. p. 12169; Tr. p. 13353.
47. Tr. p. 13353.

these costs associated with project construction were not included in the estimates of the United States.

The United States, the State of Wyoming and the Tribes all reached conclusions on the development investment costs for the future projects. Their totals, expressed in dollars per acre, are as follows:

	United States[48]	Tribes[49]	State of Wyoming[50]
North Crowheart	1,837	1,430	2,333
South Crowheart	2,033	1,622	2,509
Arapahoe	2,030	1,673	2,683
Riverton East	2,006	1,510	2,307
Big Horn Flats	2,067	1,444	2,000

It is not an easy task to assign a development cost to a given project when experts in the field cannot agree on what is an accurate estimate. While I respect the experience, education and expertise of those witnesses testifying on this matter, I conclude that the conclusions presented by the United States, with the qualifications set out below, are reasonable and realistic and are the figures I adopt in determining the feasibility of the future projects. A brief discussion follows explaining my conclusion.

The experts who appeared on behalf of the State of Wyoming and the Tribes gave a partial impression that they were advocates of positions favorable to their clients rather than experts doing an independent, unbiased analysis of the feasibility of constructing irrigation projects. This is not a condemnation of their work or opinions and it is understandable how a certain degree of advocacy could develop during such

48. United States Exhibit WRIRC-245, p. 42.
49. Tribes' Exhibit 13, p. 35.
50. Plaintiff's Exhibit WRIR F50-4.

lengthy and important proceedings. It is, however, significant enough to warrant the conclusion that the preponderance of the evidence supports the position of the United States.

Furthermore, the thorough approach of Dr. Mesghinna, whose testimony exhibited an independence detached from any preconceived estimates of what should be the result, satisfied the burden of proof and constituted the best evidence of what is a reasonable conclusion on engineering feasibility. He examined every aspect of his task carefully and applied accepted engineering concepts to each decision. In particular, I find the preponderance of the evidence supports the design system testified to by Dr. Mesghinna, the twenty-five percent (25%) engineering and contingency cost factor, and the drainage system proposed. The evidence presented and the history of western irrigation practices demonstrates the need for greater cost factors and proposed drainage than what was provided for by Keller Engineers. But I cannot throw off my conclusion that Banner Associates, Inc. overstated the cost overrun potential in their thirty-five percent (35%) factor for engineering and contingencies. Dr. Mesghinna was cautious in estimating the likely expenses to be incurred and yet he did not inflate them beyond a point of reasonable estimation.

As stated above, there is one qualification to the adoption of the United States' system design. Earlier in this Report, I concluded that the arable land base adopted from the United States must be reduced by a reasonable percentage - 10% to 15% - to compensate for error and inaccuracy.[51] That percentage reduction must carry through, for consistency, in the analysis of engineering feasibility. I find that Dr. Mesghinna compen-

51. See pages 149 and 150 of this Report.

sated for that problem in part by decreasing his acreage totals five percent (5%) for lands that may be used for farmsteads or roads.[52] Therefore, his acreage totals must be reduced by only an additional ten percent (10%) to compensate for error and inaccuracy resulting from his use of the HKM arable land base.

I conclude that the following is the acreage totals for the future lands which satisfy the engineering feasibility determination:

Project	Net Acreage
North Crowheart	34,993
South Crowheart	4,238
Arapahoe	3,437
Riverton East	3,442
Big Horn Flats	2,410
TOTAL ACREAGE:	48,520

E. DIVERSION REQUIREMENTS

Having determined the net acreage, there remains the need to determine the diversion requirements necessary to service the acreage and final economic tests. Once again, the parties disagree as to what is the appropriate diversion requirement.

Dr. Mesghinna calculated the diversion requirement for each of the future projects by considering the amount of water needed for crop growth and the efficiencies of application, distribution and conveyance. He made his determination on a monthly basis and tailored the calculations to fit the requirements of the climatic zones associated with each project. Within each of the efficiency determinations, he considered several factors, including average wind velocity, water holding

52. Tr. p. 4290.

capacity, cropping patterns, root depths, type of delivery and conveyance systems planned, source of water, conveyance distance, amount and velocity of water in the canals, and management techniques. Applying these factors, he determined the total diversion requirement, unit diversion, and source of water for each future project. His conclusions are as follows:[53]

1. United States' Assertions by Project

North Crowheart:	
Unit diversion:	3.81 acre-feet/acre/year
Total diversion:	147,767 acre-feet/year
Source:	Wind River
South Crowheart:	
Unit diversion:	4.29 acre-feet/acre/year
Total diversion:	20,137 acre-feet/year
Source:	Wind River
Arapahoe:	
Unit diversion:	4.39 acre-feet/acre/year
Total diversion:	16,720 acre-feet/year
Source:	North Fork Popo Agie
Riverton East:	
Unit diversion:	4.60 acre-feet/acre/year
Total diversion:	17,536 acre-feet/year
Source:	17,040 acre-feet/year from the Big Wind River; and 496 acre-feet/year from Little Wind River
Big Horn Flats:	
Unit diversion:	2.70 acre-feet/acre/year
Total diversion:	7,212 acre-feet/year
Source:	4,748 acre-feet/year from the Big Wind River; and 2,464 acre-feet/year from Little Wind River
TOTAL DIVERSION REQUIREMENT:	209,372 acre-feet

53. United States Exhibit WRIRC-245.

2. Overall Efficiency Percentage

The State of Wyoming contested the diversion requirement of Dr. Mesghinna, claiming it should be 108,424.3 acre-feet.[54] In addition to reasons discussed earlier, the State contended an overall efficiency of fifty percent (50%) should be used in calculating the annual diversion.[55] Mr. Bishop, relying on his years of experience, stated "a close management and husbandry of the water resource will provide a 50 percent overall efficiency in projects of this kind."[56] Banner Associates, Inc. reviewed the United States' reports and did not conduct a completely independent analysis of the future lands. Mr. Bishop admitted that his overall efficiency estimate did not have the components of application, distribution or conveyance efficiency.

I find the United States' claim for unit diversion and total diversion to be reasonable and supported by the preponderance of the evidence. The average water duty testified to by Dr. Mesghinna of 3.9 acre-feet per acre[57] is more restrictive than the 1 cfs per 70 acres allowed holders of certificates of appropriation by Wyoming statute.[58] Dr. Mesghinna testified that his

---

54. Plaintiff's Exhibit WRIR FFB-3.
55. The agreed formula for this determination is:

$$\frac{\text{Net Irrigation Requirement}}{\text{[divided by] Overall Efficiency}} = \text{Annual Diversion Requirement}$$

Thus the higher the efficiency, the lower the annual diversion.
56. Tr. p. 12168. See also the Bishop discussion under the Historic Lands section, supra.
57. Tr. p. 4326.
58. W.S. 41-4-317 (1977).

water duty "is quite low as compared to what is going out right now" in other areas around the Reservation.[59]

Numerous witnesses who testified at the December 1981 hearings in Worland substantiated Dr. Mesghinna's estimates of current diversions and presented testimony of present water use significantly greater than the United States' claim. Mr. Ballenger of the Cody Canal Irrigation District testified to use of water twice as great as the basic state allowance and stated, "You just couldn't get your field irrigated with a foot of water per 70 acres with your flood irrigation."[60] Mrs. Bales on cross-examination testified that she and her husband could not continue their operation without supplementary water in excess of the basic statutory allowance.[61] Mr. Davis, a farmer from Emblem, Wyoming, testified that if he were required to use no more than 1 cfs per 70 acres in his farming operation, he "would be looking for a gullible buyer with a little money, but I think I would want out of it real quick and real bad."[62]

It would be unreasonable and inequitable to impose a duty on the Indians which is far in excess of what is currently expected of other water users in Water Division No. 3. I agree with the observation of Mr. Bishop that the time has arrived to initiate better management of our water resources and to utilize technology which will increase efficiency. I believe the United States' approach embraces that position and incorporates in the proposed irrigation development plan management and construction techniques and technological methods which surpass the typical farming operation in Wyoming. Justice does not allow a

59. Tr. p. 4327.
60. Tr. pp. 14149W and 14155W.
61. Tr. p. 14188W.
62. Tr. p. 14046W.

denial of the claims for the Wind River Indian Reservation on the basis that their proposal does not achieve the greatest possible efficiency using the most current technological and agricultural advances. This is particularly true when the record contains so many examples and admissions of current uses by other individuals which border on sheer waste when tested by the standards advocated by the State of Wyoming. Therefore, subject to the cut below, I adopt the unit diversion requirements advanced by the United States.

The total diversion requirement advanced by the United States must still be reduced by the ten percent (10%) factor for error and inaccuracy from the arable land base, as discussed earlier. Using the unit diversion figures of Dr. Mesghinna, and applying them to the acreage totals concluded above, the total diversion requirements for the future lands are as follows.

2. Summary of Acreage Totals After Engineering Test

Project	Net Acreage	Unit Diversion (acre-feet/acre)	Total Diversion (acre-feet/year)
North Crowheart	34,993	3.81	133,324
South Crowheart	4,238	4.29	18,181
Arapahoe	3,437	4.39	15,088
Riverton East	3,442	4.60	15,837
Big Horn Flats	2,410	2.70	6,507
TOTAL	48,520		188,937

I discuss the additional claim of the Tribes for Stagner Ridge and Big Horn Flats Extension future lands after the following economic feasibility discussion.

F. ECONOMIC FEASIBILITY

The last aspect of the practicably irrigable acreage test to be considered is whether the contemplated future lands can be irrigated "at a reasonable cost." No other aspect of this litigation produced more complex subject matter and testimony nor more divergence in respective positions than this question of economic feasibility. The United States presented an economic feasibility analysis which produced a benefit-cost ratio determination. The Tribes maintained two positions. First, they responded to the conclusions of the United States. Second, they contended, as discussed earlier, that economic feasibility was only one method to determine practicably irrigable acreage, another method being whether the lands in question are similar to other lands and projects actually in operation which have sustained long-term irrigation. The State of Wyoming followed the benefit-cost ratio approach, reaching substantially different conclusions from those of the United States.

The expert for the United States who testified concerning his economic feasibility analysis was David Dornbusch of David M. Dornbusch & Company, Inc. His approach, as detailed in his report[63] and testimony, established a format for analysis which was followed by the other experts. I will follow that format also for the purposes of this discussion.

1. Evaluation of Crop Yields

Mr. Dornbusch considered elevation an important factor affecting his analysis, particularly as it affects crop yields. He concluded at the outset that the Reservation should be divided

63. United States Exhibit WRIRC-268.

into two categories; "highland" areas, being lands with an elevation of 5900 feet or greater, and "lowland" areas, being lands lower than 5900 feet. His opinion was based on a Bureau of Indian Affairs Completion Report, Agricultural Extension Service personnel, personal expertise, and interviews with farmers in the area.[64] The State of Wyoming contested this, and its economists testified that 5500 feet would be a more appropriate dividing elevation.[65] I find the evidence and testimony of the United States to be more persuasive and conclude that the preponderance of the evidence supports a difference in estimated crop yields between those lands above 5900 feet and those lands below 5900 feet.

(a) Patterns

Having made the initial distinction on elevation, Mr. Dornbusch then established cropping patterns for his economic analysis. Based upon extension service reports, personal expertise, interviews with area farmers and "interviews with other knowledgeable people on or near the Reservation,"[66] he established the following:

Crop	Lowland Percent Distribution	Highland Percent Distribution[67]
Malting Barley	5	17
Nurse Malt Barley	16	16
Alfalfa	67	67
Corn Silage	5	--
Corn Grain	7	--

64. United States Exhibit WRIRC-268; Tr. pp. 4948 - 4949.
65. Plaintiff's Exhibit WRIR EJ-2; Tr. p. 14722.
66. Tr. p. 4942.
67. United States Exhibit WRIRC-268, Table 3, p. 11.

Economists for the State of Wyoming were in substantial agreement with the above cropping patterns. however, they proposed the planting of dry beans instead of corn and corn silage, and used slightly different proportions of alfalfa.[68] Dr. Jacobs based the changes on personal experience and observation.

I find the cropping patterns proposed by Mr. Dornbusch reasonable and acceptable and are supported by a preponderance of the evidence. The difference between the relative positions is minimal and testimony and evidence presented of historic cropping patterns clearly supports the use of corn silage and grain as well as the percent allocation on alfalfa. Mr. Dornbusch placed only a minimal weight on corn in the lowlands and eliminated it completely on the highlands. That use of corn in a cropping pattern is clearly supported by a preponderance of the evidence.

The next factor, crop yields, producted substantive disagreement among the experts. Mr. Dornbusch for the United States projected yields and prices for the future projects based on a study done of the Midvale Irrigation District by Doug Agee, interviews with farmers in the area, and interviews with agricultural extension personnel, as well as application of his own experience and research.[69] Inherent in his conclusions, and a reason for greater malt barley yield projections, were adjustments made to account for qualitative differences between the proposed project lands and the Midvale Irrigation District lands and differences in the respective methods of irrigation and management. His yield and price conclusions, as they

68. Tr. pp. 14719-14720; Plaintiff's Exhibit WRIR EJ-8.
69. Tr. pp. 4952-4953.

appear in United States Exhibit WRIRC-268, Table 1, page 4, are as follows:

Crop	Units	Annual Yield Per Acre Lowland	Highland	Price Per Unit Dollars
Malt Barley	Bushels	100	90	2.71
Baled Straw	Tons	.75	.75	35.33
Nurse Barley	Bushels	88	79	2.71
Baled Straw	Tons	.75	.75	35.33
Alfalfa	Tons	4.5	4.1	52.99
Aftermath	AUM	1.5	1.5	5.48
Corn Silage	Tons	20	--	15.90
Corn Grain	Bushels	89	--	2.55
Aftermath	AUM	1.6	--	5.48

Dr. Jacobs for the State of Wyoming testified to lower yields for malt barley, 90 bushels for lowland and 80 bushels for highland,[70] and disagreed as well with the nurse barley yields. He relied on the Agee report and defended his position by stating it "appeared that those [Dornbusch's] malt barley yields were high".[71] His argument was based on a perceived need for a consistent use of the Agee report and he did not discuss the merits of Mr. Dornbusch's reasoning for deviating from the Agee figures for barley.

I find the testimony and evidence of the United States on this matter to be more objective, complete and persuasive than that of the State of Wyoming. I appreciate and respect the qualifications of the economic experts for the State, but I find Dr. Jacob's testimony more argumentative than objective. His approach seemed guided by a preconceived opinion and predetermined direction to diminish the claim of the United States rather than a professional independence to analyze the merits of the projects. Mr. Dornbusch's development of the higher yield

70. Tr. p. 14693.
71. Tr. p. 14694.

projection was reasonable and well supported by the evidence. The future projects incorporate state of the art technology and improved approaches to irrigation farming not currently used by farmers in the area. Better technology and management makes higher yields reasonably foreseeable, and given evidence of current similar yields already obtained by farmers in the area, I find the preponderance of the evidence clearly supports the projections of the United States.

(b) Production Costs

There still remains an additional point of disagreement between the parties on crop yields. The State of Wyoming argued that full yields could not be obtained for all crops on future lands in the first few years of production. This was attributed to cultivation of new lands, placement of equipment, and implementation of management techniques.[72] Mr. Dornbusch made no such reduction in his crop yield projections. However, he addressed the issue from the production cost side of the equation, increasing his per acre costs to account for the possibility of lower yields in the initial years of operation.[73] I find this cost method reasonable and an acceptable solution to the matter and, therefore, make no alteration to the crop yield projections of the United States.

The crop prices used by both the United States and the State of Wyoming in the next step of the analysis were substantially the same. Both parties used normalized prices, with the United States using the period of 1974 through 1978[74] and the

72. Tr. p. 14716.
73. Tr. p. 6133.
74. Tr. p. 4961.

State of Wyoming using 1975 through 1979.[75] This aspect brings the parties closer to agreement than in almost any other area of the economic analysis and therefore requires little comment. For the sake of convenience, and in light of my adoption of the crop yields of the United States, as well as the fact that Wyoming's prices are actually higher for malt barley, I adopt the crop prices of Mr. Dornbusch shown above, and find them supported by a preponderance of the evidence.

The determination of production costs produced a tremendous divergence of opinion which contributed significantly to the ultimate disparity between the parties' benefit-cost ratios. While the approaches of the United States and the State of Wyoming were similar, certain decisions reached and applications made by the economists were so diametrically contrary that they warrant individual treatment here.

Mr. Dornbusch developed a series of tables itemizing the various components of the production costs for each crop.[76] He used the format suggested by the Agricultural Extension Service and began with the report of Doug Agee as a reference point. Verification of all costs, operations and equipment used was made through interviews with farmers in the region.[77] Through those interviews and using his own experience and research, Mr. Dornbusch normalized all costs to 1979 figures after making adjustments to compensate for higher yields projected, greater distances to travel, larger farm units, cooperative use of equipment, and use of unemployed Indians for labor.[78] His conclusions for production costs for the selected crops are as follows:

75. Tr. p. 14726.
76. Tr. p. 4973; United States Exhibit WRIRC-268, Tables 2A-2E.
77. Tr. p. 4974.
78. Tr. pp. 4975-4995.

Crop	Per Acre Cost
Malt Barley	$142.73
Nurse Barley	$146.53
Alfalfa	$77.30
Corn Silage	$172.04
Corn Grain	$148.93

2. Machinery and Equipment

While there was some agreement from the experts for the State of Wyoming as to methodology and certain cost elements, several aspects of Mr. Dornbusch's production costs drew opposition. Specific areas of disagreement included farm unit size and the question of economies of scale, machinery prices, useful life and hours of annual use, labor costs, management costs, and normalization procedures used. These will be discussed individually.

Dr. Jacobs for the State testified that he determined his costs based on a 320 acre irrigated farm, which was the size used by Doug Agee in his budgets.[79] Consequently, a full array of equipment would be required for each 320 acre tract. Mr. Dornbusch, on the other hand, approached the question by determining what would be the most efficient level of use of any given piece of equipment without establishing acreage limitations, based on his assumption that the projects could be developed and managed either cooperatively by groups of Indians or as a tribal enterprise. The equipment would be communally used under his scenario to service as many acres as feasible and would not necessarily be associated with a particular tract of land. He admitted that this was a deviation from

79. Tr. p. 14848.

the Agee report, but testified that his discussions with Agee supported the assumption.[80]

I find the approach taken by Dornbusch more realistic, and his assumptions of tribal cooperation on the projects is not only reasonable, but well supported by the preponderance of the evidence. The 320 acre limitation suggested by the Agee report is understandable in light of the reclamation laws existing during the settlement of lands by non-Indian farmers and has a relevancy when discussing those lands. The Wind River Reservation Indians obviously are not bound by those restrictions in the development of the future projects and may therefore reasonably rely on the most efficient use of all machinery in determining an appropriate production cost estimate.

My finding that the preponderance of the evidence supports the equipment efficiencies of Mr. Dornbusch receives further support from the testimony given in Worland by several ranchers and farmers. Mr. Burchill Hopkin of Powell, who is secretary-treasurer of the Elk Water Users Association and an irrigation farmer of about one thousand acres, testified on cross-examination as to the degree of use of his machinery. When asked about the scale of his operation, he responded, "I could not afford the same amount of machinery that I have if I were only operating 320 acres. I can barely afford it at a thousand acres."[81]

I accept the Dornbusch position that it is not necessary to establish specific acre tract sizes in evaluating the production costs of the future projects and to do so imposes arbitrary restrictions on what would most likely be the approach to development of the lands by the Tribes. When a cooperative use of

80. Tr. p. 4980.
81. Tr. pp. 14344W-14345W.

the machinery can be anticipated, the more prudent approach is to examine the best use of that equipment. But even if a tract size were to be selected, the 320 acre suggestion of the State of Wyoming is unrealistic and can only lead to an unreasonable inflation of the production cost estimate.

The second distinctive area of disagreement is a corollary of the above discussion. The State of Wyoming contended that the figures of the United States for machinery prices, estimated life and hours of annual use were unrealistically low. Mr. Dornbusch testified that he derived his prices and depreciation schedules from the Agee report figures, normalized to 1979 prices as adjusted or confirmed by farmer interviews.[82] Dr. Jacobs obtained his figures from a variety of sources.

Both experts nevertheless agreed generally as to what constituted necessary pieces of equipment needed for the farm operations. Much of this evidence was considered under the Historic Lands section, supra. A detailed discussion of this matter is therefore unnecessary.

The United States clearly met its burden of proof on estimates for prices, useful life and hours of use. Mr. Dornbusch's approach was reasonable and obtained figures which could realistically be expected in the future lands development. He used reliable sources consistently, applied sound assumptions based on the anticipated method of development, and verified the figures obtained by interviews with farmers in the region. The experience and knowledge of an active farmer in this matter can equal or surpass that of an economic expert and reliance on their input can only add credibility and support to any conclusion based on their input.

82. Tr. pp. 4977-4985.

The State of Wyoming was unsuccessful in shifting back the burden of persuasion on this point through the testimony of Dr. Jacobs as to his prices, useful life and hours of use. This aspect of the testimony exemplifies an earlier remark in this report concerning the advocacy, rather than objectivity, of the economists for Wyoming. The cross-examination of Dr. Jacobs raised serious doubts in my mind as to his selection of figures and brought me to the conclusion that some prices were selected to serve an end result rather than as a fair estimate of a reasonable cost. Overall, the preponderance of the evidence clearly supports the United States machinery prices, depreciation schedules and estimated hours of annual use.

3. Labor Costs

The next area of disagreement concerns the employment outlook for Indians on the Reservation and the appropriate costs to attribute to farm labor for the projects. It should be noted that the economists did agree on the economic principle of opportunity cost and setting the value of an item by determining its next best use. They further agreed that the opportunity cost for labor may be set at zero when that labor comes from unemployed individuals with a bleak outlook for employment in the near future. The dispute arises in the determination of the proportion of the labor costs for the future lands which have a zero opportunity cost.

Mr. Dornbusch determined that the rate of unemployment on the Reservation creates a situation where the supply of labor far exceeds demand. He also concluded that skills necessary for farm labor would be present in the available work force. His information and statistics were obtained directly from the

Bureau of Indian Affairs on the Reservation as well as from interviews with people knowledgeable in similar situations and in the historic experience of the Indians on the Reservation.[83] He testified that unemployment on the Reservation for the past ten years has consistently remained at a level of about forty-five percent.[84] Given these facts, he determined conservatively that eighty percent of the labor costs would be zero in his economic analysis, based on the assumption that unemployed Indians would constitute that percentage of the labor force. The remaining twenty percent of labor would be at a full opportunity cost.

Dr. Jacobs for the State of Wyoming testified that he would cost farm labor on the Reservation between seventy-five and one hundred percent.[85] He disagreed with Mr. Dornbusch's assumptions as to the use of unemployed Indians for labor and the continued high level of unemployment on the Reservation. He did not conduct any interviews nor any independent research to support his conclusions, but relied mainly on his own "judgment call".[86]

I find that a high percentage of unemployment exists on the Reservation and conclude that the preponderance of the evidence clearly supports the position of the United States on farm labor costs. The United States met its burden of proof on the matter with the testimony of Mr. Dornbusch and the information upon which he relied. The history of the Reservation consistently shows a level of unemployment far in excess of the rest of Wyoming. That condition may well continue in the

83. Tr. pp. 4987-4988.
84. Tr. p. 4989.
85. Tr. p. 14828.
86. Tr. p. 14733.

future and a reliance on such an assumption is reasonable. Additionally, the very nature of the future projects supports the assumption. To enhance the prospects of success, the Indians must approach the development of the future lands cooperatively and work together on an ongoing basis to insure their continued productivity. Such an involvement almost dictates a significant role for the Indian labor force on the Reservation.

4. Management Costs

The next area of disagreement, managements costs, closely relates to the farm labor cost dispute in light of the relative positions of the parties. Mr. Dornbusch followed an accepted practice of using a percentage of the production cost subtotals for his management costs.[87] He selected ten percent as his rate for two reasons. First, that is the rate used by the Water Resources Council and is higher than rates used by agricultural extension service people, including Doug Agee. Second, he felt that the higher rate would be consistent with his use of progressive farming techniques which would reasonably result in higher management costs.

Mr. Dornbusch then adjusted those figures to reflect his assumption that some of the management costs could be reduced through the use of unemployed Indians who would be trained by skilled managers. He developed a schedule of training Indians to assume management positions, starting with the figure of ten percent in the first year as the amount of management to come from the unemployed. Each year for the next nine years he

87. See generally Tr. pp. 4990-92 for a discussion of Mr. Dornbusch's approach.

would then replace an additional ten percent of the management with unemployed Indians who would receive similar training. To me this is another application of "incremental methodology." Within ten years of the start of the projects, then, the entire management of the future lands would consist of formerly unemployed Indians. Finally, he then applied his discounting techniques to determine a present management cost for the economic analysis to account for this multi-year plan.

The position of the State of Wyoming conflicted with Mr. Dornbusch's management cost conclusions on two grounds. First, Dr. Jacobs maintained that management costs should be proportionate to gross returns rather than the subtotal of production costs. Dr. Jacobs admitted that he was not positive how this disagreement would affect the relative cost estimates, but guessed that his approach would produce slightly higher costs.[88] Second, the State renewed its assertion that the full cost of management should be used, and should not be decreased through anticipated use of unemployed Indians. In light of my conclusion below regarding the second matter, and given the uncertainty expressed by Dr. Jacobs himself as to the significance of using returns rather than costs to determine management costs, I find it unnecessary to discuss the first matter at length and conclude that a preponderance of the evidence supports Mr. Dornbusch's application of the management cost rate to the production cost subtotals.

I reiterate my findings and conclusions regarding use of the unemployed Indian labor force and adopt them as they relate to management costs, although I recognize that the management question presents a different situation. Absent a

88. Tr. p. 14734.

showing that the current labor force on the Reservation already possesses the necessary management skills, it would be unreasonable to expect all of the management to come from the unemployed at the outset of the development. Mr. Dornbusch acknowledged that, and specifically planned for proper training to take ten years. I find such a time period and training program to be reasonable and a preponderance of the evidence supports such a position. Irrigation farming, like so many other aspects of our society, has developed sophisticated approaches and specialized techniques and equipment. A progressive management plan would obviously require training in those techniques and some time and training must therefore be anticipated. But that can be accomplished on a gradual basis within ten years and ignoring such a possibility can only unreasonable inflate the management cost estimates.

5. Normalization Process

The final area of disagreement on production costs is the normalization procedure used by Mr. Dornbusch to bring all costs to a common 1979 price. The normalization process, as discussed earlier in this report regarding crop prices, is the multiplying of each cost figure by a factor designed to "smooth out" the fluctuations in prices which are higher or lower than their true "representative" price.[89] Normalization is more than the removal of the inflation factor in costs because it attempts to adjust for the inevitable fluctuation of prices in a given year which is caused by a variety of factors unrelated to inflation.

Mr. Dornbusch used the normalization factor adopted by the Water Resource Council, which is a statistical approach for

89. Tr. pp. 4959, 5014.

determining what the smooth price curve is through the use of historic prices.[90] Recent prices are given greater weight as being more representative of the target price and the goal of the entire process is to achieve a process whereby prices for four given years can be weighted to predict the price for the fifth year. Mr. Dornbusch varied from the original Water Resource Council guidelines in that he normalized both costs and returns so as to have a common set of figures to use in his analysis. When he brought this discrepancy to the attention of "staff" members of the Water Resource Council, Dornbusch testified that the individual contacted indicated a change in the principles and standards to reflect Dornbusch's finding would probably be made.[91]

Dr. Jacobs offered little concrete evidence as to the scope of his disagreement with Mr. Dornbusch's approach, how his position differed, and what real effect the disagreement has on the respective economic analyses of the two economists. In his sensitivity analysis, Dr. Jacobs criticizes Mr. Dornbusch as being "confused" on the normalization process and the prices used in Mr. Dornbusch's analysis.[92]

In light of my ruling on the normalization of crop prices, and given the testimony and evidence discussed here, I find Mr. Dornbusch's approach reasonable, professional and supported by a preponderance of the evidence. Dr. Jacob's criticisms are not persuasive and offer no objective, positive alternative. Mr. Dornbusch's use and reliance on Water Resource Council advice and statistics is prudent and reflects

90. Tr. pp. 5014-5015.
91. Tr. pp. 5016-5017.
92. Plaintiff's Exhibit WRIR EJ-2, p. 14.

as accurate an approach as could be required in a field which attempts to estimate a price for a given year.

The rest of Mr. Dornbusch's analysis, with the exception of the application of a discount rate, consists primarily of the application of the above prices and results to the structure of the analysis. One potential area of dispute, water delivery system costs, proved to produce such similar results from the economists that the State of Wyoming considered the point moot.[93] I will adopt the United States' figures for consistency and will not discuss the matter further. Calculations left to be done include accounting for the crop distribution in the highland and lowland areas as it relates to costs and returns, weighting the returns to the project areas and the appropriate percentage of highlands and lowlands in each, and accounting for the on-farm irrigation costs and irrigation system costs. These calculations do not represent a substantive aspect of the analysis. As such, a detailed analysis of each step and calculation is unnecessary in reaching a conclusion on economic feasibility.

6. The Discount Rate

The final disagreement in economic feasibility determination is the discount rate to be used in the analysis. Few matters are more complex, less exact, or certainly more divisive than the question of what is the appropriate discount rate. Economists from all sides urged and argued the concept and application and came to little or no agreement. The United States felt this matter was so singularly important that it elected to devote its entire rebuttal case to discount rate.

93. State of Wyoming's Proposed Findings of Facts, Volume V, Part III, Findings 18-33, p. 815.

A discount rate was necessary in the economic analysis by virtue of the approach used to determine the feasibility of the future projects. The economists structured their studies by looking at the developments as one hundred year projects. Obviously, that entails projection of costs and benefits for the entire period but comparison of the two sets by a single reference point. A computation becomes essential to bring those costs and benefits back to a present value which can be analyzed fairly and consistently with all other values involved. The discount rate performs that task -- determining the present value of the 100-year stream of costs and returns associated with the projects.

For those who became so intimately involved with this case, I have probably devoted sufficient discussion to the definition of discount rate and to its importance in the analysis. But to those who approach this subject for the first time, who may have a 15% home mortgage, 19% automobile loan, or who have watched the prices of groceries or gasoline in the past few years, one further observation is in order. The economists generally agreed that their studies excluded present or expected inflation and concentrated on what the "real" discount rate should be. It is apparent that if inflation were a factor in the discount rate, four percent, for example, would not be realistic. But inflation is not a factor in determining the discount rate for this economic analysis. It may seem that such an exclusion reduces the entire study to an academic discussion and voids it of any realistic or probative value. The very nature of an economic analysis does make it academic to some degree, because it is an attempt to estimate future benefits and costs, their present values, and whether the value of the benefits exceeds the value of the costs. However, that analysis has

definite probative value in evaluating the claims for the future lands and, as long as inflation is absent from both sides of the equation, the analysis can be helpful in evaluating the projects. In a society and world which has learned to live with staggering rates of inflation and economic uncertainties, it is difficult to accept an analysis which excludes that concern. But it must be kept in mind that inflation has not always been such a menace, that it may not be so prevalent in the future, and that it affects both sides of the equation when it is present.

The United States presented two very competent witnesses in its case in chief and rebuttal to testify on discount rates. Mr. Dornbusch, as part of his analysis, testified that his research and professional opinion led him to the conclusion that the correct rate was in the range of two to four percent.[94] He selected the upper end of that range for his analysis and felt four percent to be a conservative rate.

Dr. Stephen Goldfeld, currently a professor of economics at Princeton University and chairman of the economics department, testified on rebuttal as to his opinion of the appropriate rate and also in response to the testimony of the experts for the State of Wyoming. His credentials were extremely impressive and his experience clearly made him an expert witness on the subject matter. He testified that his range of rates would be one to four percent and would select two and one-half as the correct rate if required to do so.[95]

Dr. David Brookshire, an associate professor of economics at the University of Wyoming, was called by the State of Wyoming to present his opinion on discount rates and how it applies to the economic analysis. He testified that one single

94. Tr. p. 5049.
95. Tr. pp. 15517-18.

discount rate should not be selected, but rather a range of rates should be used to represent the diverse sectors of the American economy.[96] He selected a range of four to eleven percent for his feasibility analysis as appropriate.

The Tribes also presented testimony on the subject through Dr. Ronald Cummings, professor of economics and director of the Program in Natural Resources Economics at the University of New Mexico. He took the initial position that discounting was not necessarily proper in evaluating the future projects inasmuch as we are dealing with the needs of future generations of Indians which may be as important as the needs of the current generation. He did conclude, however, that he would select, if required to, a discount rate between two and four percent.[97] He also felt that Mr. Dornbusch's analysis may have been too conservative regarding secondary costs and benefits.

Analyzing the testimony of expert witnesses who are in substantial disagreement is never an easy task, and this item is no exception. However, in listening to and weighing the testimony and evidence, I am of the conclusion that the preponderance of the evidence clearly supports the conclusions of Mr. Dornbush and I adopt his analysis as a very professional, objective and reasonable study of the future projects. No doubt must exist as to my reasons for this conclusion, because it definitely is not based on a potential intimidation that three experts must be better than one. To conclude as I have on that basis would be clearly imprudent, and might encourage future litigation to become parades of experts in an effort to be

96. Tr. p. 14522.
97. Tr. pp. 8871-77; 8880.

the party with the most experts. It is for this reason that the following analysis and discussion is doubly essential.

Dr. Brookshire supported his analysis with an article published by Professors Fraumeni and Jorgenson entitled, "Rates of Return by Industrial Sector in the United States, 1948-76."[98] That article presents average rates of return for a variety of sectors in the American economy scanning a period of 28 years. Rather than using the aggregate rate calculated in the article to determine a weighted average real rate of return for all sectors, Dr. Brookshire developed his own summary, which excluded certain sectors and brought him to his range of rates of seven to eleven percent. The most significant sector excluded was the household sector, and that, together with a basic distinction between average rates and marginal rates, caused Dr. Goldfeld to be critical of Brookshire's conclusions.

Dr. Goldfeld argued that the household sector should not be eliminated from the analysis. Since the economic analysis concerns the diversion of capital away from existing projects to the proposed development, he contended that capital could just as easily come from the household sector as from any other sector. The various sectors should be treated equally, and Goldfeld warned that the selection of sectors from the Fraumeni-Jorgenson analysis should not be reduced to a "beauty contest."[99]

The second disagreement Dr. Goldfeld had with Dr. Brookshire's conclusions concerns the opportunity cost of capital, the possibility of diverting it to the new projects and the role "marginal" rates as opposed to "average" rates plays.

98. Tribes' Exhibit DB-1.
99. Tr. p. 15557.

Dr. Goldfeld's discussion of this is eloquent and succinct enough to warrant its inclusion in its entirety.

> The Fraumeni-Jorgenson study basically gives us average rates of return. That is okay on its own terms as an estimate of average rates of returns. With the qualification of data revisions, I have little quarrel with the study. On the other hand, for purposes of making opportunity cost calculations and for defining a discount rate for making those opportunity cost calculations, the relevant thing is not the average rate of return, the relevant thing is the marginal rate of return, i.e., the rate of return which is earned on the last project, if you will, or the last bit of capital investment because when resources are diverted away from something, they are not diverted away from the average project, the best project is still going to get done, they are diverted away from the weak sister project, the one that just scrapes by.
>
> And it is very critical in this kind of thing to make the proper distinction between average and marginal. The reason it is critical is the marginal can be much, much more than the average, perhaps as much as a half or a third of the average rate of return.[1]

Given the economic principle of the diminishing marginal productivity of capital, Dr. Goldfeld concluded that the marginal rate would be lower in this analysis, but that it would be the more accurate approach.

In addition to the above conclusions, the prevailing economists supported their positions with sound economic principles and various aspects of other pertinent analyses. I find their arguments and conclusions more persuasive and I am compelled to agree with Dr. Goldfeld's response to Dr. Brookshire's analysis.

---

1. Tr. pp. 15505-06.

Furthermore, I find it incredible that an economic or sensitivity analysis could conclude that not a single acre of the future lands claimed is economically feasible! I do not need to address or rely on Dr. Cummings' position that a benefit-cost ratio analysis may be improper in this case, nor that it is not the only means to find land irrigable. Furthermore, the Tribes' position that an economic benefit analysis is only one test to determine practicably irrigable acreage need not be addressed in light of this conclusion. The testimony and evidence of the United States through two excellent economists stands unrefuted in the conclusion that certain acres of land are economically feasible to irrigate.

In addition to the above evidence and testimony upon which I base my conclusion, there is one additional bit of testimony so much on point as to warrant its inclusion here as further basis for the conclusion. At the December, 1981 hearings in Worland, Mr. Willard Wilson testified on ranching and farming in part from his role as a director of the First State Bank of Thermopolis. When asked on cross-examination about inflation, risk factors in lending, and the profit margin expected by a bank, Mr. Wilson testified, "I mean, it just comes back to plain old business there, and you're probably going to advance money between, and that depends upon the circumstances, from a half a percent to three percent."[2] While I readily agree that "profit margin" and "real discount rates" are not synonymous terms, they nevertheless are closely related and one certainly affects the other. This testimony clearly shows how a financial analysis will change when inflation is not a factor and certainly lends support that the Dornbusch real rate has a financial world counterpart that is not too dissimilar.

2. Tr. p. 13927.

7. Conclusion and Summary of the Final Measure of Award After Economic Tests

All of the above leads to the conclusion of what lands are practicably irrigable and therefore deserving to be the measure of a reserved water right. Excepting 10% for purposes above stated, I find that a preponderance of the evidence supports the case of the United States and, given the reduction of acreage as discussed earlier in this Report, I find the acres below to be practicably irrigable, and conclude that they should be the measure of a reserved water right for the amounts stated.

Project	Net Acreage	Unit Diversion (acre-feet/acre)	Total Diversion (acre-feet/year)
North Crowheart	34,993	3.81	133,324
South Crowheart	4,238	4.29	18,181
Arapahoe	3,437	4.39	15,088
Riverton East	3,442	4.60	15,837
Big Horn Flats	2,410	2.70	6,507
TOTAL	48,520		188,977

G. LIMITATION ON EXPORTING AND CONSTRUCTION SCHEDULES

1. Exporting

Under "Groundwater", infra, the exporting of groundwater is measured by the evidence to deny its practice, and findings are made accordingly. Here, we deal with the exporting of surface water, both that which is herein awarded based on historic irrigation and as the measure of practicably irrigable acres in future projects.

Beginning with the dicta of Winters and repeated often in the briefs and arguments of federal parties, the assertion is advanced that without water, the Wind River Indian Reservation Land would be worthless. Time and again this premise is advanced to justify an implicit reserved water right.[3] Does it not follow therefore that permitting other than agricultural and related uses for waters awarded appurtenant to historically irrigated land, if carried far enough, can virtually destroy the purpose for which the Reservation was created? If not, can it be denied that at least the land will then "be worthless," on which the very premise rests for a reserved right in the first place? It is difficult to escape the conclusion that if the Indians wish to let long established farmland go to dry land grazing and lease water to others, that this practice falls within the guidelines of several legal authorities that the best water law is that which leaves the owners of a water right with a "choice to do what they wish for the most efficient use of their resource."[4]

It is a difficult matter, and there is a bleak silence in existing law or decisions with which to be guided.

The Tribes have asked for enough water to satisfy agricultural and related use on historic lands for themselves, for Indians holding land in fee, and including Type VII and Type VIII lands, and for Tribal future projects. We have stressed that this does not mean that reserved water may not be used for purposes other than agricultural and related uses. The question of use, or change thereof, is not one of the items contained in the Judge Joffe reference for my determination.

---

3. See section Intent and Purposes, supra, p. 56.
4. See Trelease, Frank, New Water Legislation, XII, Land and Water Law Review, 2, p. 414-428.

What is fairly before me, however, is the conspicuous fact, woven throughout the evidence in this long trial, that a consumptive use by Indians over and above the consumptive use determined on the practicably irrigable acres, which serve as the measure of this award, would constitute an unjust denial of water to downstream uses in Division 3.

I therefore find that in order to assure full rights to Indians without violence to the full rights of others, limitations of volume and scheduling on said consumptive use must be set for any surface waters herein awarded, historic or futures. I find that there is no other way to deal justly with the users of return flow.

The summary finding from all of the evidence regarding consumptive use of existing and proposed irrigable acreage ranges from 20% to 30% of diversion requirements.[5] Thus, the decree herein will limit consumptive use of waters whether used on or off the Reservation to no more than 25% of the annual diversion amounts awarded herein in the event there is to be exporting of surface water off the Reservation, or used upon the Reservation for other than agricultural and related purposes. Such use is limited to 10% of 25% of the annual diversion in each decade following the date of this Report, unless upstream storage is in place to provide for additional incremental storage. Nothing herein shall prohibit the leasing or bargaining of Tribal waters to downstream users or other entities within Division 3, one consideration of which would be the non-use by Indians and a dedication of said water to non-Indian agricultural and related uses in Division 3.

5. Tr. p. 5239.

2. Limitation on Construction Schedules

The award herein for future projects is charged with one additional limitation. Because the incremental method has been relied upon by federal witnesses to support economic feasibility, I feel it only fair that it can be employed in this decree to avoid the possibility of economic damage to other water users in the Division.[6] Further, this is an application of the "Rehnquist doctrine" that reserved water rights should be applied with sensitivity.

This decree will reflect that only a certain percentage per decade of the total futures acreage should be completed and into full-scale operation so that the full award of future projects will not be completed and in operation, unless, of course, upstream storage facilities shall have already been constructed to provide for the additional water requirements of said future projects.

This would accomplish several things. It would encourage all parties, state and federal, Indian and non-Indian, without coercion or compensation, but purely in their own self interest, to welcome and participate in negotiations and encourage the legislative and negotiating processes which would authorize and appropriate costs of upstream storage facilities. The time is ripe for said discussions. Blue Holes alone has a possibility of 175,000 acre-feet per year of usable annual yield. It would store over 400,000 acre-feet of water most years.[7]

6. Witness Dornbusch testified that a percentage of the unemployed Indians will be used each year over and 10-year period to obtain full management personnel for new projects from the ranks of unemployed Indians. Tr. pp. 4991-92.

7. It is true that the smaller amount of water which is kept in storage in a reservoir, the less that is lost to evaporation and spillage, but the greater becomes (continued) ...

This incremental construction schedule is of assistance to the Tribes in that there would be for the first time a certain and definite decree basis for both Tribal water and Tribal acreage for project construction. It would be of equal assistance to the United States in that it would be assured a definite schedule and incremental additions to the reserved doctrine being applied, and this would fulfill the United States' obligation to the Tribes without incurring immediate financial risks flowing to the benefit of Wyoming state water right owners.

And lastly, Wyoming would benefit from said construction scheduling also, as she would be provided at long last with a certainty of Indian and federal planned uses for water in Division 3. I take notice that federal legislation now seeks to settle the Winters rights in various western states by a combination of negotiation, followed by ratifying legislation. One proposed bill receiving encouragement from the Western Resources Council would provide compensation for those who are prohibited from exercising the full rights they own because of the establishment of a reserved Indian right. Such a bill might well trigger a decade of uncertainty and great expense if some manner is not found to obtain upstream storage soon, and thus mitigate federal liability and achieve a just decision without its enactment.

I believe all of the tragedy of such a course can be averted if this decree requires incremental construction of all new practicably irrigable acres and will be followed thereafter of rapid construction of Blue Holes impoundment. I believe this

7. (continued)... the risk of inadequate storage to meet future needs. One cannot predict how the United States, the Tribes and Wyoming will strike a balance between these competing factors in the operation of the Wind River upstream storage facilities in the future.

throws a burden on no one. The Indians cannot be heard to complain as the evidence in this case is without proof that the Indians are capable of raising funds within the immediate future necessary for full construction projects to put water on the futures land. While there is no duty upon them to do so, nevertheless an objection would have been credible had there been some evidence of the availability of financing. As it is now, it appears that no matter what benefit-cost ratios are arrived at, or discount figure used, in the real world of today's interest and inflation and uncertainty in agriculture, doubt persists that much of the "futures" land may ever be a part of any newly constructed irrigation project.

This being the case, the decree herein will limit construction to no more than ten percent (10%) of total awarded acreage for future projects in any given decade following the date of this Report, unless upstream storage facilities are in place.

III. THE DETERMINATION OF PRACTICABLY IRRIGABLE ACRES ON THE RESERVATION'S ADDITIONAL TRIBES FUTURES

Two lingering bits of evidence: 1) the appearance of Stagner Ridge in a list of State awarded water rights following the 1905 Act;[8] and 2) the wide disparity between the arable base of Big Horn Flats (19,644 acres)[9] and the awarded acreage of 2,410 acres,[10] have caused me to closely re-examine all the Tribes' exhibits that dealt with their request for 25,000 acre-feet per year of additional water to serve 9,970 arable acres that had been excluded by the Stetson experts and other United States witnesses on Stagner Ridge and Big Horn Flats.

These two additional claims are sited on impressive, elevated terrace benches and my review included the testimony of Dr. Lyman S. Willardson and of his two associates, Ron Bliesner and Jack Keller. Their testimony was a recapitulation of the statements, charts and maps contained in Tribes' exhibits involving irrigation system design and engineering review of the conceptual irrigation development plan for the Wind River Indian Reservation.

This required a direct, virtually page by page comparison, with United States Exhibit WRIRC-245, which was a similar

8. Plaintiff's Exhibit SR-3 Revised, although Stagner was obviously cancelled years later for non-use.
9. United States Exhibit WRIRC-43, p. 27.
10. See page 205 of this Report.

conceptual irrigation development plan published by Stetson Engineers.

The Keller exhibits stated that the on-farm irrigation system, pipeline distribution system, canal pumping plant, and drainage system portions of the Stetson irrigation development plan were analyzed for their adequacy of design and the appropriateness of cost. From all this, the Keller people concluded that certain physical features of the pumping plant were more elaborate than needed, i.e., they would build them without roofs in climatic conditions of Central Wyoming, and felt that these reductions from the Stetson pumping plant facilities were appropriate. Mr. Keller insisted that some Stetson cost figures were high considering the volume of materials involved, and used as a basis to justify cuts, that the latest life "cycle costing techniques should have been employed to optimize the design component." In fact, I found the word optimize used so often in the Keller reports that I was constrained to look up its definition -- to find it is nothing more than optimism. Mr. Keller concluded that sprinkler operating pressures were higher than necessary, and by reducing the pressure on sprinkler systems, felt it could make savings accordingly. Dr. Williardson found that the drainage intensity was too high and stressed that on having been consulted months earlier by the Stetson people for review of their findings, there was no mention made of reviewing the drainage intensity at that time.

Mr. Keller concludes that these findings rest upon "the possibility for streamlining and optimizing the design" in "using lower, but nevertheless appropriate, unit prices. This in turn resulted in a significant lowering of the component and operating costs as compared to those prepared by Stetson." (Empha-

sis added.) The Keller report summary is concluded with the statement that the canal systems "and related structures in the Stetson plan were not analyzed because there was insufficient time to adequately review and investigate these features."[11] I can appreciate this observation, and Wyoming's proposed findings remind me that Dr. Willardson engaged in an entire field effort on which he relied to draw many of his conclusions for a 9,264 acre project over a period of less than two hours of actual examination.[12]

Though it may be a more unkind cut than is warranted, Wyoming's proposed findings also observed that "the entire field effort upon which Dr. Willardson relied to reach his conclusions regarding drainage of all proposed future projects took place over a period of twenty hours. This is equivalent to an intolerably hasty examination of over 2,500 acres per hour. Assuming Dr. Willardson met the Bureau requirements of 1/4th mile transects for a semi-detailed investigation, he must have set a new world record for the marathon with a time of 1 hour 37½ minutes. And all while wearing a tie and street shoes!"[13]

As if the above review of the Keller Engineering is not sufficient to conclude that the additional claim of the Tribes futures should be summarily rejected, there is the following fact.

Stetson engineers, who excluded the Stagner Ridge and Big Horn Flats Extension on the basis of cost, are the same Stetson engineers on whose expertise I have relied for including the acreage of the five future projects earlier referenced herein. Their expertise was evident in Arizona v. California, and

11. Tribes' Exhibit 13, p. 2.
12. Tr. p. 8694.
13. Wyoming's Proposed Findings of Fact, Part III, p. 838.

is internationally recognized. Their work herein has been looked upon with authority and with respect by virtually all of the Wyoming experts who testified, as has been noted in the section prior to this dealing with the futures.

So if Stetson eliminates Stagner and Big Horn Flats and if the testimony of Dr. Mesghinna is to be relied upon as thoroughly as was done in the futures section, how can it be disregarded in this instance when Dr. Mesghinna and other Stetson experts, in designing the entire irrigation projects for these areas, excluded the two after consultation with United States' economists?

If the United States did not seek water rights for these lands, having examined them and concluded they are not practicably irrigable, is it not obvious that this fact should control in rejecting these two projects? I will play devil's advocate with these questions for several pages.

Having been rejected by the United States, a much higher test of acceptability ought to be shown by these two projects to overcome the conclusions of the United States' experts themselves that these areas would not meet the test for practicably irrigable acres.

Despite all that has been said on these two above premises, there is a nagging doubt in my mind that seems to rise naturally from all of the evidence entered about rejecting Stagner Ridge and Big Horn Flats extension. I am reminded of the observations made in Jones on Evidence,[14] published in 1912, and affirmed by many legal scholars since, of the observation regarding expert testimony:

14. Jones, Burr W., The Law of Evidence in Civil Cases, 2nd Ed., April 1912 (Bancroft-Whitney, SF).

> "...The notorious fact that experts of equal credibility and skill are found in almost every important cause testifying to directly opposite conclusions illustrates ...the fallibility of such testimony....It is a matter of common observation in the courts that witnesses of the highest character and undoubted veracity may be easily led as experts to expouse and defend a theory with all the zeal of an advocate...." Section 390 at p. 491.

Therefore, should I not hold -- not because of the Willardson testimony, but in spite of it -- that the 9,970 acres so vigorously asserted by the Tribes as being equally deserving of reserved-right water as the future acreage asserted by the United States as guardian, should be included in the allowable acreage? No acreage in all Division 3, and on all the Reservation -- futures, historic, adjudicated, unadjudicated, fee or otherwise -- has as economic a water duty as the Big Horn Flats Extension and the Stagner Ridge futures. Both the experts for the United States and for the Tribes come up with a figure for the annual diversion requirements for this entire acreage of 2.52 acre-feet per acre per year, and conveyance efficiencies in closed pipes exceeding 95%, factors of efficiency for higher than that of any other project on the Reservation.[15]

15. Tribes' Exhibit 13, pp. 4-5. In this study, since there are seepage losses between the diversion and the main pumping station that must be accounted for in the diversion requirements, but not applied to the water pumped, the concept of conveyance and distribution efficiency was applied differently. Distribution efficiency is taken to be the efficiency of the system from the main pumping plant to the on-farm systems; and the conveyance efficiency is taken as the efficiency from the diversion dam to the main pumping plant. Since the canal is lined and the remainder of the distribution system is closed conduit, a distribution efficiency of 95% is used. The canal from the diversion to the pumping plant is short, limiting the opportunity for seepage so a 95% conveyance efficiency is used.

Assuming that remaining efficiencies in these two projects will be as favorable as those on the remainder of Big Horn Flats and North Crowheart, then Stagner and the Big Horn Flats Extension could result far and away in the most efficient, rather than the most questionable, of futures programs. The 2.52 water duty for these two proposed areas is the most favorable of any area on the Reservation, or for that matter, anywhere else in Division 3.

But two indelibly important experiences from all of the evidence and argument herein adduced keep tipping the scales away from the devil's position here, and mandating that my finding must reject all acreage of both these Tribally recommended projects. These factors are:

First, Dr. Willardson's testimony will not disappear from mind in that he would reduce the drainage planned from all the other Mesghinna projects, costing these savings to these extension projects, which he claims would then be economical.[16] This testimony reminds me of the burdens faced by Congress and the settlers in Division No. 3 and along the Big Muddy -- the Farson project and the Kendrick project -- after several generations of obstensibly similar regard for proper drainage and of the failures that ensued.

To accept this evidence would be to repeat the mistakes of the past and to risk again new areas where insufficient drainage would again leave fields as soggy, wet lands, and large, caked areas of alkali flats.

The second reason was the James Merrill argument which was raised against these extensions, and I cite Mr.

16. Tr. pp. 8665-8720.

Merrill's admonitions of setting in a bank of 9,000 horsepower pumps at the ridges of Stagner and Big Horn Flats as carrying to an unacceptable degree the expense necessary for projects of this size.[17] It also served to remind me that if I am to put credence in the Mesghinna testimony that North Crowheart's approximate 35,000 acres is economically doable, even though 59 covered pump stations are to be constructed, I must also accept his testimony that similar facilities for Stagner Ridge and Big Horn Extension's 9,970 acres simply render them uneconomical.

For reasons listed first in this section, and as a result of the balance tipped against them as explained above, I find that no acreage can be included from either the Big Horn Flats Extension or Stagner Ridge in the tabulation of a quantified reserved water right for the Wind River Indian Reservation.

17. Tr. p. 15037. See also Tr. pp. 15049-15052 on yields, costs overruns.

PART THREE

PART THREE

I. GROUNDWATER

Compared to the massive effort that dealt with practicably irrigable acres and the quantification of allowable diversions therefor, there is little evidence or argument regarding groundwater under the various Federal enclaves in Water Division 3, notably the Indian Reservation.

Certainly it has been the policy of the Tribes to drill wells for both domestic and livestock uses of the Indians, and deeper wells for water for secondary recovery of oil in the Reservation's oil fields. There is a void in the record of indications that Indians applied for state permits to drill their domestic wells. From certain exhibits we find that operating oil companies on the Reservation have applied for over the years, and have received from the State Engineer, Permits to drill for secondary recovery water.[1]

1. Watts, Tr. p. 11573, infra. Also, water requirements for domestic, municipal and commercial uses were identified by witnesses for Dornbusch and Company. Page, Tr. p. 803, et seq. This testimony concluded that the expected increases in water requirements would not be significant as long as there were live streams recharging the groundwater sources involved (Tr. p. 1031). Messrs. Page and Brogden were the respective experts for the positions of the United States and the State, accordingly. Each made reconnaissance studies and testified regarding potential well yields. Mr. Page said his probability for accuracy concerning well yields on United States Exhibit WRIRC-31A, ...(continued)

1. (Continued)...Table 3, was considerably better than fifty percent (50%). (Tr. p. 1030) In contrast, though not addressing specific yields of wells along tributaries, Mr. Brogden was very bearish on development generally, charging that overactivity in either area will do damage to both surface and groundwater sources. Mr. Merchant of Dornbusch and Company determined that it was economically doable to develop oil, gas, coal, uranium, phosphate rock and gypsum (Tr. pp. 520, 547-8, 552-4, 568, 573, 586), and Mr. Page put the usage as follows, based upon Exhibit C31-A, Table 4 (see chart below).

Mineral/ Activity	Location	Peak Annual Water Use (Acre-Feet)	Required Continuous Pumping Rate to Meet Peak Annual Water Demand (gpm)	Water Sources
Oil Enhanced Recovery (Existing)	Multiple Locations	6,580	4,080	Wind River underflow and various sources of local deep ground water including, but not limited to, the Madison formation, Big Horn dolomite and Frontier formation.
Gas Refining (Existing)	1S-6E (East of Riverton)	6	4	
Sulfuric Acid Production (Existing)	1S-4E (Riverton Area)	95	60	Wind River formation and/or municipal surface or ground water (Wind River formation).
Anhydrous Ammonia Production	1N-4E (Riverton Area)	4,250	2,630	Wind River formation and/or municipal surface or ground water (Wind River formation).
Coal Surface and Under-Ground Mining	6N-1E (Muddy Creek Area)	25	15	Shallow to moderate depth ground water in local sandstone and conglomerate beds (Fort Union, Lance and Mesaverde formations).

1. (Continued)...

Mineral/ Activity	Location	Peak Annual Water Use (Acre-Feet)	Required Continuous Pumping Rate to Meet Peak Annual Water Demand (gpm)	Water Sources
In Situ (Gasification and Syngass Production	2S-6E (Alkali Butte Area)	2,800	1,740	Wind River formation (off-site), or moderate depth ground water in local sandstone and conglomate beds (Lance and Mesaverde formations) or deeper aquifers.
Electricity Generating Station	6N-1E (Muddy Creek Area)	2,490	1,540	Wind River underflow (off-site).
Uranium Underground Mining	7N-5W	15	9	Local shallow to moderate depth ground water (Aycross and Wind River formations or equivalents).
Yellowcake Processing	7N-5W	475	290	Wind River formation and/or Crow Creek surface flow or underflow (off-site).
Phosphate Underground Mining	1S-2W	5	3	Little Wind River underflow.
Beneficiation and Calcining Plant	1N-4E (Riverton Area)	425	260	Wind River formation and/or municipal surface or ground water (Wind River formation).
Phosphoric Acid Production	1N-4E (Riverton Area)	400	250	Wind River formation and/or municipal surface or ground water (Wind River formation).
Gypsum Surface Mining	7N-1E to 3W	10	6	Local shallow to moderate depth ground water (Chugwater Group and Park City/Phosphoria formation).
Wallboard Production	1N-4E (Riverton Area)	300	190	Wind River formation and/or municipal surface or ground water (Wind River formation).

These mineral resources and corresponding water supplies are found to be reasonable, but the sources will not apply to additional volumes of water needed to meet the future needs for these activities.

As noted, infra, the deeper aquifers are to be the source for future industrial expansion, and this is necessary so that live streams will not be overburdened in recharging aquifers and thus endanger surface flows upon which both present and future irrigation depend on the Reservation and downstream in Division 3.

A. THE CAPPAERT DECISION

The dominant case (cited in both the briefs of Wyoming and of the Tribes as holding totally opposed conclusions) is, of course, Cappaert v. United States.[2] It involved Devil's Hole, a cavern on Federal Land in Nevada containing an underground pool and inhabited by unique species of desert fish. It was reserved as a National Monument in 1952 by Presidential Proclamation. In 1968 the Cappaerts began pumping water from the same source as the water in Devil's Hole, thereby reducing the water level in Devil's Hole endangering its fish species. Subsequently, the Cappaerts applied to the Nevada State Engineer for permits to change the use of water from several of their wells. The National Park Service filed a protest; the State Engineer overruled the protest and granted the permits; the United States then filed suit to limit the Cappaerts' pumping of

2. Cappaert v. United States, 426 U.S. 128, 48 L.Ed.2d 523, 96 S.Ct. 2062 (1976).

their wells. The District Court permanently enjoined Cappaert pumping that would lower the water below a certain level necessary to preserve the fish, holding that in establishing Devil's Hole as a National Monument, the President reserved appurtenant unappropriated waters necessary for the purpose of that reservation, including preserving the pool and its fish, and that the Federal rights antedated those of the Cappaerts.

The Court of Appeals affirmed, holding that as of 1952, when the United States reserved Devil's Hole, it acquired by reservation the water rights sufficient to enjoin Cappaerts from pumping if said pumping impaired the existence of the fish in the pool. It held that when Federal Government reserves land from the public domain, by implication, it reserves water rights sufficient to accomplish the purposes of that reservation; and that the purpose of reserving Devil's Hole being the preservation of the underground pool, the Court appropriately tailored an injunction to the minimal needs thereof, curtailing pumping only to the extent necessary to preserve a water level adequate to protect the pool's scientific value, as a natural habitat of the fish species sought to be preserved.

The findings also held that since the implied-reservation-of-water doctrine is based on the necessity of water for the purpose of the Federal reservation, the United States can protect its water from subsequent diversion whether the diversion is of surface water or groundwater.

The Cappaert case is a unique pronouncement. It is capable of serving two diametrically opposite goals, in this case, the goal of Wyoming and the Tribes. The State cites Cappaert in support of its position of refusing the Tribes a

reserved right to groundwater, citing a Cappaert "Headnote II" which says:

> II
> GROUNDWATER
> No cases of this Court have applied the doctrine of implied reservation of water rights to groundwater.[3]

And the Supreme Court then refutes the Nevada argument that the implied-reservation-of-water doctrine applies not to groundwater by finding that the water in this pool is surface water. "The Federal water rights were being depleted because, as evidence showed, the groundwater and surface water are physically interrelated as integral parts of the hydrologic cycle." This quotation is made by the Supreme Court in citing its groundwater expert, whose statement on this interrelationship squares with that of Wyoming's counterpart witness, Robert Edwin Brogden,[4] and the United States' witness, Oliver Page.[5]

But the statement under II above ceased to be the truth on June 7, 1976, for it was on that date that the Supreme Court handed down Cappaert, thus producing the first case in history to apply the reserved doctrine to groundwater, although it is called by yet another name.

And the Supreme Court buttresses this action by quoting studies of the Congress of the United States, by the National Water Commission issued in 1973. The following quote, from one of the Nation's outstanding water authorities who is counsel to Wyoming in the instant case, was included in that study:

---

3. Cappaert v. United States, Ibid, at p. 142; 48 L.Ed.2d at 536.
4. Tr. p. 11840.
5. Tr. p. 769.

> "There appears that Nevada itself may recognize a potential interrelationship between surface and groundwater since Nevada applies the law of prior appropriation to both..."[6]

Only if the purpose for which the Wind River Indian Reservation was created is threatened with defeat can the Cappaert doctrine conceivably be applied herein. And comparing the Cappaert facts to those of this adjudication leaves me no alternative but to reject out of hand the United States argument that uses of groundwater by non-Indians around and within the Reservation can be enjoined if found detrimental to the aquifer levels under Reservation surface.

To defeat the very existence of two Tribes of Indians numbering in the thousands and living on 2,500,000 acres of land is one thing; to limit non-Indian use of a groundwater source on which some Indian and non-Indian landowners depend, and into which both drill with equal right and common concern, is quite another. There is nothing in Cappaert law, or in the Winters concept, or in the evidence of this long proceeding, which warrants a right to the Tribes to impinge upon the groundwater users of adjoining areas, or those of fee-owned inholdings within the boundaries of the Reservation. The findings herein warrant this conclusion and the proposed Decree will reflect it.[7] This recognizes of course that

---

6. See generally F. Trelease, "Water Law - Resource Use and Environmental Protection," 457-552 (2nd Ed. 1974): C. Meyers and A. Tarlock, "Water Resources Management," 553-634 (1971).

7. This is the subject involved in the Riverton Airport matter on page 7, Introductory Statement, supra.

   From the transcript, beginning at page 781, there occurred one of the several exchanges that peppered this trial regarding the scope and effect of groundwater usage to be adjudicated. It follows: .... (continued)

neighboring citizens who use groundwater from a common source may quarrel over causes of groundwater depletion. Groundwater management to conserve aquifer life is a relatively new but fast growing reality. There is no reason to limit its practice to non-Indians alone.

---

7. (Continued)...

> THE SPECIAL MASTER: Earlier you mentioned that you have an interest in the formations totally without the boundaries of the Reservation because they constitute one of the sources that might very well contribute water toward some of the structures under the surface of the Reservation. I'm not inclined to want to agree with that.
>
> MR. MEMBRINO: I think what Mr. Page was testifying to is the location of the Wind River formation under the Riverton area. The United States is making claims for use of water, whether it be surface or groundwater only for development of lands held in trust or resources held in trust for the Indians. We're not talking about a claim for lands held by non-Indians. I think that point has to be maintained.
>
> THE SPECIAL MASTER: Yeah, but what you're maintaining is that the United States has a proprietary right and ownership to groundwaters under, under non-Indian surface if those groundwaters are necessary for the well being of the Indians who live in a different area from that, where that water is found. Isn't that what you're maintaining?
>
> MR. MEMBRINO: I'm maintaining -- in a word, yes, but it should be made clear that we have to look at this just as we look at surface water. The fact that surface water occurs off the Reservation, perhaps a hundred miles away and is sufficient only to serve the needs of the first priority, be it Indian or non-Indian, then a remote water user cannot interfere with that -- with that water supply to the detriment of the prior right holder. So it's -- ....(continued)

7. (Continued)...

THE SPECIAL MASTER: You think that concept applies to groundwater as well as the surface water?

MR. MEMBRINO: I think emphatically the reserve right extends to groundwater and the --

THE SPECIAL MASTER: This concept of no interference until a prior owner has a right to use it does apply to groundwater as well as surface water? And if so, what's your authority of that, if you believe that?

MR. MEMBRINO: I would refer Your Honor to the United States Supreme Court decision in the Cappaert case, which was decided in 1976, and recognized that the need for water, groundwater to maintain a national monument would be held paramount, the right for that -- to that water would be held paramount to an off-monument groundwater user. And we have gone, we have briefed this issue --

THE SPECIAL MASTER: You've answered my question.

MR. WHITE: May I say one thing?

THE SPECIAL MASTER: Mr. White.

MR. WHITE: First off, the characterization of the Cappaert case extending the reserve right doctrine to groundwater is one that the State must violently disagree with, because the Supreme Court said it doesn't involve groundwater. The second point I'd like to make is that the position Mr. Membrino seems to be taking is a far reaching one because I notice the Madison formation is one of the formations beneath the formation (sic) [Reservation], and carrying his argument to its logical end, is that the Wind River Indian Reservation would be able to control the development of Madison formation because Madison formation happens to be underneath the Reservation. That is the reason, not the legal basis, but the reason that the State is so anxious about this water issue. (Tr. pp. 781-784.)

B. MINERAL RESERVATION CLAIM

Nor is argument of Federal counsel persuasive that the minerals under the surface of Riverton are reserved for the Tribes. Acts of June 5, 1920 and March 4, 1921 (41 Stat. 874, 915, and 1367, 1404) provided funds for the Riverton Reclamation Project. The United States did not purchase any lands, but authorized funds for construction of the project. About 100,000 acres were sold to non-Indians and proceeds credited to the Tribes as provided by the 1905 Act. Subsequently, some 70,500 acres not required for the project, as with other unsold land, were restored to full Tribal ownership by the Act of August 15, 1953 (67 Stat. 592).

The 1953 Act was unclear as to minerals because it provided in Section 5 that ninety percent of the revenues from minerals under the lands purchased by the United States would be paid to the Tribes, but did not make clear whether leasing would continue under Indian Mineral Leasing Laws or public land laws. See United States v. Seaton, 248 F.2d 154 (10th Cir. 1955). By the Act of August 27, 1958, 72 Stat. 935, Congress legislatively overruled Seaton and made clear that, as to the lands purchased in the 1953 Act, "all of the right, title, and interest of the United States in all minerals, including oil and gas" are "declared to be held by the United States in trust for the Shoshone and Arapahoe Tribes" and must continue to be leased under the Indian land leasing laws.

This recognition of the Tribes' ownership of the minerals under the reclamation area was consistent with an earlier act of August 21, 1916, 39 Stat. 519, in which Congress empowered the Secretary of the Interior to lease the lands subject to the 1905 Act for oil and gas exploration "under such terms and

conditions as shall be by him prescribed" with the proceeds of royalties from the leases to be "applied to the use and benefit of said Tribes."

A mineral reservation results from the explicit language of a statute; an implied reservation of water does not. A reserved mineral clause in withdrawals is a matter of public record, and is consistent with patents which were issued to the settlers on the ceded lands. It would have been an act of repugnance for Congress to have also reserved groundwater from the early settlers who had an immediate dependence upon water wells for their very existence.

The Tribes maintain that a reserved right assures them the use of replenishable groundwater. "Both their reserved right and their ownership of the resources of the Reservation assure the Tribes the use of minable groundwater if they choose and their prevention of such mining by anyone else".[8]

I disagree. Ownership of the Reservation is indeed exclusively in and for Indians, and Wyoming has been careful in these proceedings not to violate that ownership, nor to commit acts that would do violence to her own Constitution, which disclaims any right, title, jurisdiction or control of said lands.

C. WATER IS NOT LAND

The water in the aquifers which occurs in the formations of said lands is a constantly changing amorphous body of liquid and is just that - water - and not land. It is water that moves by virtue of seepage, percolation, conductivity, or other natural movement. Unlike land, it is transient in its nature. It is

8. Plaintiff's Exhibit WRIR BG-3, first page.

groundwater today which was yesterday's surface water flowing in the Wind River or its tributaries. Congress has ratified that this water is the property of the State of Wyoming. This adjudication is designed to establish the rights of the various parties to the use of said water. This adjudication will award and prioritize rights to the United States and to the Indian Tribes for the permanent use of set amounts of water, mostly surface and some ground. It will confirm or affirm adjudicated state rights of several thousand citizens to similar water uses, surface and ground. It will define the status of many uncancelled permits to said use. What it is not authorized to do is to pass upon ownership of state water.

D. EVALUATION OF RESOURCES

An evaluation of the resources was made by Oliver Page for the United States' position, an expert in hydrogeology and groundwater uses. Similarly, Mr. Robert Brogden, a groundwater geologist, testified for the State and added his expertise to the complex formations and hydrologic structures of the Reservation. Both were credible and professionally solid and, of course, differed more than somewhat in their conclusion.

To determine presence and extent of groundwater, Mr. Page identified the geology, and conducted pump tests to measure well pumping rates and groundwater levels.[9]

Mr. Page considered the groundwater facilities to be in a virgin condition where it was found that they had not been developed or drawn down heavily. I find that his testimony warrants the conclusion that on the Wind River Reservation there is abundant groundwater supply in virgin condition.[10]

9. United States Exhibits WRIRC-31A, C-32.
10. Tr. pp. 920-23.

Little was stated regarding safe yield due to the fact that groundwater use is neither concentrated nor in significant quantities to make realistic determinations of safe yield. Mr. Page determined an amount of groundwater in storage in the Quaternary deposits comprising saturated alluvium of the Wind River Reservation in the area of 360,000 acre/feet, but that not all of this water is available for pumping from wells. He concluded that the alluvium is essentially full of water under present conditions of water development; and further stated the glacial and landslide deposits are not significant to groundwater supply, nor are the terrace deposits which are generally elevated above streams and creeks and cannot receive significant infiltration from surface flows.

The one Tertiary deposit apparently rich as an aquifer is the Wind River Formation.[11] It is a deposit of interbedded sandstone conglomerate, silt stone, clay stone and shale, and contains other minerals, and ranges in thickness from zero to approximately 5,000 feet. Outcrops of the Wind River Formation are present throughout the central portion of the Reservation. In addition to the Wind River, the Madison, Fort Union, and Bighorn Dolomite are late Tertiary and older formations, and generally occur deeper, that have proven to be water-bearing.

The witnesses agree that the principal source of water saturating the alluvium is surface water from streams flowing over the alluvium deposits, and this geologic fact requires certain limitations upon the use of the groundwater which will follow. Other sources are irrigation return flows, some precipitation, and side flows into alluvial deposits from other formations. Well yields were stated and the findings will rely upon

11. Tr. p. 772-73, United States Exhibit C-31A.

said yields. I find that Mr. Page's estimated well yields were professional and consistent with the practice of others in his profession, and that his reliance upon United States' geological survey data for the well fields of Cottonwood Creek, Muddy Creek, Five Mile Creek, Kirby Draw, and Beaver Creek, was also reasonable and consistent.

There is no question that the Indians have the right to the use of the groundwater in the various aquifers beneath the land which is theirs, in trust or in fee. Yet the extent of the claims asserted by the United States and the Tribes renders it necessary to examine closely the evidence dealing with said aquifers and the virgin and historic flows of the Wind River to see if limitations are in order. Limitations may be necessary to assure adequacy of surface resources.

Wyoming observes[12] that there is sufficient groundwater on the Reservation for most proposed uses, and encourages a finding that future increases in water uses for municipal, domestic and commercial purposes may be met without the use of surface water. I agree, and so find.

The evidence reveals that at some locations the Madison Limestone occurs within 3,000 feet of the surface. The Big Horn Dolomite and the Frontier Formations are also listed as sources of groundwater.[13] Wyoming recognizes that the proposed mineral and resource developments include the enhanced recovery work at two oil fields, natural gas processing where existing needs are currently being met, and coal mines, an electric generating station, a phosphate rock mine, one anhydrous ammonia plant, a phosphate rock beneficiation and acid production plant, a wall board manufacturing operation plant,

12. Plaintiff's Proposed Finding 36-3.
13. United States Exhibit WRIRC-31A (Table 4).

are all uses which can find sufficient water from groundwater sources. I find that this is a fact, and I conclude that these proposed uses should rely upon the Madison and other "deeper" sources, rather than on the Wind River aquifer, and other terrace and shallow aquifers that depend directly upon the Wind River for their life. My reasons follow.

Evaluation of groundwater resources was made by witnesses Oliver Page for the position of the United States, and Robert Brogden for the State of Wyoming. Each is an expert in hydrogeology and groundwater uses. Each testified on the unique interrelationship of surface and ground water, and the adverse affect upon one if inordinate use is made of the other. I find there is sufficient evidence for me to conclude that unregulated development of shallow groundwater, if allowed, would so lower aquifers of the alluvium, such as the Wind River formation, and other shallow structures adjacent to the Wind River, that irreparable harm will result to all users relying upon the Wind River for existence. Regarding the Tribes' claim to a right to mine water and enjoin others from doing the same, witness Brogden testified that "it simply cannot be done to preserve groundwater levels and still develop either surface or groundwater."[14]

While I have doubts about the effect of that generalization until the word "develop" is defined, I nevertheless have a healthy respect for the obvious truth of that concept. Therefore, limits to the use of groundwater must be made, particularly when the claims of the Tribes, coupled with those of the United States in their behalf, tend to push the effect of the word "develop" beyond acceptable means, or beyond the fondest dreams envisioned by the authors of the Winters concept.

14. Tr. p. 11852.

Example: The United States claimed in behalf of the Tribes a total of 570,304 acre-feet per year for irrigation alone; surface water claims for livestock and municipal, domestic and commercial uses of 6,583 acre-feet per year; in addition to groundwater rights for additional water for these purposes; plus 10,048 acre-feet per year for the Arapahoe Ranch. To these totals the Tribes claimed 45,390 acre-feet per year more for irrigation; 25,159 acre-feet per year for irrigation of additional future lands, and a contingency claim of 20% of all totals, or 131,026 acre-feet per year, and in addition, all of the groundwater resources for future needs of the Indians, a quantification in terms of acre-feet being impossible because the recharge rate of the various aquifers is at present unknown and unknowable.[15] This is in effect a claim for nearly 800,000 acre-feet per year of surface water, plus the right to mine unlimited quantities of groundwater for whatever purpose, present or future. Such a demand strains credulity.

Example: A claim for both minimum stream flows as part of the aesthetic "belt"; minimum stream flows for fish and wildlife preservation, coupled with claims for maximum development of every practicably irrigable acre asked for -- these claims simply compete with one another. They appear to exceed original stream flows on twelve of the Wind River tributaries -- these claims therefore by their very volume and nature are in conflict one with another, and this must be recognized before any test for a just measure of award is applied.

E. SUMMARY AND AWARD

In summary, the decree herein will grant rights to the use of groundwater to the Tribes, subject to the limitations and conditions mentioned above.

1. This decree will grant no right to anyone or entity, Indian or non-Indian, to mine groundwater; nor will it grant

15. United States' Statement of Claims, supra; Amended Statement of the Shoshone and Araphoe Tribes Concerning the Measurement of Tribal Reserved Water Rights, filed July 20, 1981.

any right to replenishable groundwater by requiring others to abstain from beneficial use of groundwater under their own surface.

2. The Tribes are awarded the use of groundwater which is fed by the Wind River, The Little Wind, The Popo Agie, into the Wind River aquifer and other shallow terrace and river-level formations for domestic, livestock, and present commercial uses, in the amounts now being used, and in increases rendered necessary by population growth. A right to surface diversion from the Big Wind, the Little Wind, and the Popo Agie for municipal and domestic uses, in amounts listed in the table below, is also awarded herein.

I find that Mr. Merchant's study is a reasonable estimate of the Indian population, its growth, and the present and projected need for water for municipal, domestic and commercial purposes. I find that the Tribes are entitled to a reserved water right with a priority date of 1868 for those purposes, in amounts based on Mr. Merchant's conclusions, but in no event to be more than the following figures through the year 2020:

Area	Source	Acre-Feet Per Year 1980	2000	2020
Riverton	Big Wind River	18	32.4	46.8
	Groundwater	18	32.4	46.8
Fort Washakie	Little Wind River	455	799.2	1,166.4
Ethete	Little Wind River	257	450.0	658.8
Boulder Flat	Popo Agie River	26	44.4	67.2
Arapahoe	Groundwater	155	273.6	397.2
Pavillon	Groundwater	2	3.6	4.8
Remainder	Groundwater	110	193.2	283.2
	TOTAL	1,041	1,828.8	2,671.2

All shallow aquifers are not to be used as a water source for future industrial development. The lower or deeper of the water bearing formations, i.e., the Madison, Big Horn Dolomite, and the Frontier, are the proper sources for water for said future industrial activities.

3. Several questions remain to be answered. They include whether or not geographic limits on use might be found to exist; whether a restraint can be placed on said other uses so that the burden of loss of return flow is not suffered by subsequent water users; and finally whether a reserved right is terminated when leased, assigned, or otherwise used in commercial transactions.

It is now firmly established that water reserved for Indian Reservations may be used for purposes other than agricultural and related uses, and the question of change in character of use is not before me. However, and as mentioned earlier in this section, the geologic evidence herein requires certain limitations on groundwater usage in order to assure that abuse will not result in irreparable damage to the Wind River aquifer and to all who depend upon it for survival.[16]

16. My authority for this limitation rests primarily upon the geologic fact that to rule otherwise would constitute a clear danger to the source of groundwater for Indian and non-Indian alike who reside in the general area of the Wind River aquifer and other similarly shallow structures. It is sometimes addressed as a limited police power. It is buttressed by a good bit of statutory law (Wyoming Statute 41-10.5, Supp. 1974, 41-3-105), and similar laws which have long existed throughout America affecting the withdrawal and transportation of groundwater from one state to another. My decision here is dictated by the geologic facts in this case, not by statute. For a thorough pre-Sporhase treatment of this subject, see an article by George A. Zunker, X. Land and Water Law Review, No. 1, p. 119 (1975).

It is self-evident that aquifers are the last reserve for potable water for men, women, and all creatures who live.

For this and other reasons and evidence alluded to above, the exporting of groundwater outside of the stipulated boundaries of the Reservation is denied.[17]

In view of the jolting effect of the Sporhase case[18] upon Western water law, a few words are in order to distinguish the above ban on exporting groundwater from the unprecedented assertion of the Supreme Court that groundwater is an article of commerce which was unreasonably burdened by a Nebraska ruling not to allow a farmer, whose contiguous lands straddled the Nebraska-Colorado border, from irrigating his Colorado acres from a well located on his Nebraska land.

The Sporhase majority asserts that Congress has not granted the States permission to engage in groundwater regulation that would otherwise be impermissible. Of course I agree, and hastily add that what Congress did indeed grant the States permission to do was to conduct general mainstream water adjudications. Wyoming, in pursuance of this Congressionally awarded McCarran Amendment role, has conducted a thorough adjudication of the entire Division, including all of the Wind River Indian Reservation, the potential for surface storage of water throughout the Division for the good of Indians and non-Indians alike, and has concluded that the recognition of reserved water rights for the Reservation does not carry so far

17. The limitations on uses of surface water, and the effect upon users of return flow, is dealt with in the Futures section, supra, (page 205) as is the matter of leasing and assignments of rights.

18. Sporhase v. Nebraska ex rel. Douglas, --U.S.--, 73 L.Ed.2d 1254, 102 S.Ct.____ (No. 81-613), decided July 2, 1982.

as to reserve a right to export groundwater from the Reservation, this not being one of the purposes for which this Reservation was founded nor is the exporting of groundwater necessary for the well being and future of this Reservation or of its Indians when surface water exists for this purpose.

Nor can the Indians be heard to complain upon a Commerce Clause analysis of this prohibition to exporting groundwater. In this proceeding, a measure of future annual water requirement has been found based upon practicably irrigable acres. That water is being allowed full use by the Indians under the Commerce Clause or export provisions, at least that portion of the water consumptively used were it not to be exported.

Nature is at least afforded an opportunity annually to renew the resources which give life to the Reservation and which flow from the snow pack of the mountain ranges of the Wind River Indian Reservation. If the Indians choose to export certain amounts of these surface waters awarded in this proceeding, they are free to do so. At least annually there is an opportunity for renewal of the storage and for an opportunity to gauge water short years. It's not that simple when aquifers are mined or overdrawn.

To permit exporting of groundwater is to jeopardize the very existence of the Wind River itself, a fact that is indisputed in the long evidence obtained specifically on this point.

For the above reasons, we believe the law, as well as the facts, clearly distinguishes Sporhase from the instant adjudication. In fact, it can be argued that if these proceedings were to award Indians the right to export groundwater while others are denied the same, Sporhase could be cited against the Indians to upset such a conclusion.

II. FISHERIES, WILDLIFE AND AESTHETICS

A. WILDLIFE AND AESTHETICS

Instream flows were claimed for the preservation of fishery habitat and, in addition, areas of aesthetic and wildlife value. By the United States' experts' definition, the "fishery flow" means the optimum mean monthly flow which will produce maximum fish habitat in a given stream reach. We will dispose of the wildlife and aesthetic claims first.

The "aesthetics and wildlife flow" claim means one hundred percent (100%) of the naturally occurring water in the lakes and streams in said aesthetic areas. The entire flow of some 64 streams - later reduced to 51 streams - is claimed for aesthetic and wildlife purposes.[19] Most of these streams, upon which a claim for total flow was made, occur in the two areas designated as the Aesthetic Belts of the Reservation. They are:[20]

> Belt No. 1: An elongated "foot-shaped" area (facing east) imprinted across the northern third of the Reservation, its ankle being the northwestern boundary; its heel, Crow Creek Canyon and Black Mountain; its long instep, a strip of high country including the Owl Creek Mountains; and its turned up "toes", the geologically famous canyon of the Wedding of the Waters, the "confluence" of the Wind and Big Horn Rivers.

19. See list under Indian Claims section, supra.
20. United States Exhibit WRIRC-7.

Belt No. 2: A right-angled triangle, the sides of which are the boundaries of the Reservation that join to form the southwesterly corner thereof, and the hypotenuse of which is a line traversing the west end of Bull Lake generally parallel to the Wind River, but west of it, and running from Sacajawea Ridge to the North Fork of the Popo Agie about ten miles from Lander.

Since non-consumptive in use, and the opposition rather minimal to their assertion, it would appear to be a relatively welcomed and unanimous matter to grant this claim for 100% instream flows for the streams mentioned in the two Aesthetic Belts of the Wind River Indian Reservation. But two facts arose from the evidence which prevent it.

First, the claim and the evidence for industrial and mineral development water requirements left a clear inference that phosphate beneficiation, uranium processing, and coal and gypsum development could very well take place in the "instep" area of Belt No. 1, and along the eastern or lower edges of Belt No. 2. And here I find that the Tribes are indeed the Masters of their own fate regarding instream flows. I do not intend to over-simplify this new development in Wyoming law, but the Tribes are much like all the other interests in Wyoming regarding instream flows in that they cannot "have their water and consume it too", so to speak.

Second, the evidence is persuasive that for the maintenance of an aesthetic and wildlife value, a stream which carries a flow of sixty percent (60%) of capacity will serve the same

purposes for aesthetic and wildlife habitat as will a stream at maximum historical flows.[21]

I therefore find that the sixty percent (60%) figure is a proper one for instream flows applicable to steams in all areas of the Aesthetic Belts on the Reservation, as detailed on Exhibit WRIR-7.

Wildlife is mentioned in the Fort Bridger Treaty of 1868, and the hunting of wildlife is thus found to be one of the purposes for which the Reservation was created. In fact, the Treaty also granted certain rights to Indians for off-reservation hunting until said lands were to be occupied by settlers. Thus a reserved right for a reasonable wildlife instream flow in the high county "Aesthetic Belts", as described in Exhibit WRIR-7, is warranted.

The Decree herein will accordingly carry out the finding discussed above and the 60% factor will be used on all claims for instream flows in the two aesthetic belt areas of the Wind River Indian Reservation. No aesthetic and wildlife instream flow award is in order for streams or portions of streams not clearly within the boundaries of the two Aesthetic Belts as defined on Exhibit WRIR-7. Instream awards on the remainder of the Reservation will be done under the Fisheries claim. We turn now to the more complex matter of fisheries.

---

21. Tr. p. 11442-43. Witness Keith makes distinctions between flows for fisheries habitat and for aesthetics and wildlife. He quotes and makes the same recommendations that 60 percent of average flow "will be excellent to outstanding" for wildlife and aesthetics. At 60 percent the stream channel is essentially completely occupied by water. A higher percentage would appear to increase velocity only, and it is not until you reduce volumes to 20 percent or so that a dried-up appearance is evident, and the aesthetic quality becomes diminished.

B. FISHERIES

During 1979 and 1980, the United States Fish and Wildlife Service in Lander developed instream flow recommendations for fishery resources on 16 selected stream reaches on the Reservation of current or potential importance for fisheries to the Tribes. The methodology used was developed by the Cooperative Instream Flow Service Group, an agency of the Fish and Wildlife Service. Both witnesses Vogel, for the Federal parties, and Sinning for Wyoming, testified to the values and conceptions employed by this group, each having had experience in working with it. Mr. Vogel developed mean monthly instantaneous flows (MMF) in the stream reaches to "maximize the available fish habitat."[22]

Once again we find the subtle advancement and purpose to be the "maximization" of a goal rather than the establishment of normal or ordinary levels, but we will deal with this later.

The 16 stream reaches are described in the following tabulation, together with the claimed monthly flows for each reach:

22. United States Exhibit WRIRC-280.

FISHERY FLOWS

Mean Monthly Flows (cfs)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Stream Reach 1 - Wind River (above Dinwoody Creek)	179	177	185	320	320	320	320	320	320	320	233	201
Stream Reach 2 - Wind River (between Dinwoody and Bull Lake Creeks)	201	200	207	284	500	500	500	500	500	444	302	239
Stream Reach 3 - Wind River (between Bull Lake Creek and Diversion Dam)	254	249	258	371	500	500	500	500	500	500	365	291
Stream Reach 4 - Wind River (between Diversion Dam and Little Wind River confluence)	256	250	260	325	325	325	325	325	325	325	325	293
Stream Reach 5 - Wind River (below Little Wind River to boundary of Boysen Reservoir Withdrawal Area)	393	384	396	500	500	500	500	500	500	500	500	439
Stream Reach 6 - Wind River (Wind River Canyon)	399	390	444	500	500	500	500	500	500	500	500	444
Stream Reach 7 - East Fork Wind River (below Wiggins Fork)	45	43	45	95	207	207	207	207	123	82	56	49

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Stream Reach 8 - Bull Lake Creek (above Bull Lake)	29	31	29	47	215	215	215	215	180	83	45	33
Stream Reach 9 - Bull Lake Creek (below Bull Lake)	30	33	31	50	255	255	255	255	178	76	41	32
Stream Reach 10 - North Fork Little Wind River (below North Fork Canyon)	19	20	20	26	80	80	80	80	69	35	23	20
Stream Reach 11 - South Fork Little Wind River (below Washakie Reservoir)	22	25	23	31	110	110	110	91	72	41	28	23
Stream Reach 12 - Little Wind River (above Popo Agie River confluence)	49	51	51	71	75	75	75	75	75	75	61	52
Stream Reach 13 - North Fork Popo Agie River (below North Fork Canyon)	17	16	15	26	77	77	77	77	52	34	23	19
Stream Reach 14 - Popo Agie River (below the North and Middle Forks and above Little Wind River confluence)	48	46	46	94	172	172	172	172	140	91	63	53
Stream Reach 15 - Dinwoody Creek (below Dinwoody Lakes)	15	14	14	21	110	110	110	110	95	38	21	16
Stream Reach 16 - Crow Creek (above Crow Creek Canyon)	3	3	3	6	12	12	12	12	7	5	4	3

In addition, the United States and Tribes claim that if the above flows, plus historic and future irrigation requirements, cannot be satisfied, that they be granted the right to construct storage facilities so that all their competing claims alone can be fulfilled.

We examine first the question of whether a reserved right exists or can be implied for fisheries habitat, and if so, what its limitations are before exceeding or distorting the purposes for which the Reservation was created. And next is resolved the question of a right to the construction of upstream facilities to satisfy Indian needs alone.

The Federal parties argue that maintenance of fisheries is one of the purposes for Congress having created the Wind River Reservation. Wyoming asserts otherwise, citing the absence of the word "fishing" from the Treaty and citing United States vs. New Mexico, supra, in which a bare majority of the United Supreme Court denied fisheries and wildlife minimum instream flows in the National Forests. Wyoming also cites the Coleville Confederated Tribes Ninth Circuit reversal as authority that granting such rights herein transcends the provisions of the 1868 Fort Bridger Treaty. A review of these cases and of briefs reveals that in at least three cases the Courts have recognized an implied reserved right for fisheries.[23]

Where history reveals that a tribe was at least partially dependent upon fishing, or that fishing was a significant factor

23. Even where no express or specific language grants fishing rights to a tribe, the Courts have occasionally found or implied a reserved right for fishery maintenance if necessary to preserve the traditional lifestyle of the tribes. Menominee Tribe vs. United States, 391 U.S. 404, 20 L.Ed.2d 697, 88 S.Ct. 1705 (1968); Coleville, supra; United States v. Anderson, No. 3643 (E.D. Wash.), July 23, 1979.

in its lifestyle, there is ample precedent for such a reserved right. The problem here is not whether a right exists. The testimony of Robert N. Harris, Sr., Chairman of the Shoshone Business Council, both on direct and as described on cross-examination by Mr. Krob, underscores the history and present importance of fishing to the Shoshones.[24] The problem instead is, exactly how much water can be decreed to flow the stream reaches for this purpose? To permit the amounts requested in the table above is to accept what one expert says is maximizing the case for fishing, and another of equal qualification says is an obviously excessive flow.[25]

Upon further examination of evidence on quantifying this use, it is appropriate to note that fishing on the Reservation, while at one time solely what is described as subsistence fishing, of latter years has become a profit making proposition for the Tribes. During the Vogel testimony, there were introduced into evidence a series of exhibits[26] revealing this activity, and the information gleaned from mailed and creel questionnaires distributed to anglers. For example:

> During 1980, 2778 fishing licenses were sold to non-Indian anglers for use on the Wind River Indian Reservation (WRIR) for the April through September fishing season....871 seasonal, 451 seven-day, 90 three-day, 327 two-day, and 1,039 one-day [licenses]. In addition, 84 ice, 105 courtesy (spouse, children) and 14 special (enrolled other tribes) permits were sold.[27]

---

24. Tr. pp. 7926-27; 7943.
25. See differing statements of witnesses Vogel, Tr. 6494; and United States Exhibit WRIRC-280, "Instream Flow Recommendations For Fishery Resources In The Major Rivers And Streams On The Wind River Indian Reservation, Wyoming," and Sinning, Tr. p. 15273.
26. Plaintiff's Exhibits WRIR FISH-200, 201, 202, 1-A, 2 and 4.
27. Plaintiff's Exhibit WRIR FISH-202, p. 1.

These exhibits also revealed a catch-to-effort ratio on the various lakes in the high mountain country of the Reservation and particularly on the following streams:

Lowland Stream C/E Summary

	Hours of Fishing	Fish Caught	Catch/ Effort
Entire Wind River	818	380	0.46
Wind River Canyon	704	216	0.31
Bull Lake Creek (below reservoir)	120	107	0.89
Bull Lake Creek (above reservoir)	110	135	1.22
East Fork	79	42	0.53
South Fork Little Wind River (above reservoir)	68	89	1.31
Dinwoody Creek	32	23	0.72
Little Wind River	19	9	0.47

Wind River C/E Summary
(Including Wind River Canyon)

	Hours of Fishing	Fish Caught	Catch/ Effort
April	108	51	0.47
May	211	61	0.29
June	160	38	0.24
July	370	150	0.41
August	373	164	0.44
September	250	101	0.40
Unknown Months	50	31	0.62
TOTAL	1,522	596	0.39[28]

28. Plaintiff's Exhibit WRIR FISH-202, p. 3.

1. Stream Reach Distinctions

It is obvious from the above that the impact of fishing for the non-Indian who purchases a license and fishes the Reservation is obviously greater on the main stem of the Wind River rather than on the various Popo Agie or Little Wind streams or tributaries. It also should be noted that in the award of a fifty percent (50%) aesthetic and wildlife instream flow that would inevitably benefit and inure to the various forks and the main stem of the Little Wind since they virtually headwater in the Aesthetic Belt No. 2. For these reasons, Stream Reaches 10, 11, and 12 on the Little Wind, and Stream Reaches 13 and 14 on the Popo Agie, will be dealt with differently than those on the main stem of the Wind River.

The testimony of witness Vogel supports the claim of the United States for an instream flow for fisheries, but we believe that his incremental methodology developed is still not so certain in its conclusions as to be given flows in the amounts recommended. We accept and place credence also in the testimony of Mr. Sinning, and particularly find that one of his criticisms of what he called numerous errors of Mr. Vogel was one regarding percentage of annual virgin flow in which we believe there is substantial validity.[29] On one Stream Reach, Mr. Vogel was claiming 44.4% of the virgin flow as "optimum flow". Other methodologies according to Mr. Sinning have stated that 30% would be adequate flow to maintain a good fishery. Maybe they're saying the same thing.

For this and other reasons which were apparent from a comparison of all the evidence herein, we believe that the instream flows requested for Stream Reaches 1, 2, 3, 4, 5, 6,

29. Tr. p. 15273.

7, 8, 9, 15 and 16 are appropriately reduced to fifty percent (50%) of the claimed flow. And even Stream Reach 6, because of overriding contractural obligations with the Bureau of Reclamation regarding releases at Boysen Dam, would have to be modified so that no requirement for flows shall result in violation of contracts now in existence for release of downstream water requirements.

A reduction of forty percent (40%) of the requested amount for Stream Reaches 10, 11, and 12 will be decreed by virtue of two apparent facts from the evidence: 1) an absence of fish statistics to show fish experience or usage on these reaches; and 2) the fact that they are fed from the well protected higher tributaries of the Aesthetic Belt No. 2.

Regarding Stream Reaches 13 and 14, a reduction of sixty percent (60%) of the requested flows will be made for similar reasons.

I am urged to find that sufficient water will remain in the various Stream Reaches for which the United States and the Tribes seek fishery instream flows, after all irrigation diversions, to adequately maintain a fishery in these Reaches and that, therefore, I should find no need to quantify or decree rights to separate instream fishery flows.

It is my belief that the substance of this request is true, and that following this decree and its incremental applications of the reserved rights granted, there will be adequate flows in most if not all of the Reaches that make the granting of an instream flow unnecessary. But this is a final determination of the adjudication of the right to use waters and an instream right is a new concept which cannot be ignored or postponed and deferred on the hope that other uses will fall into place. For this reason, the matter was faced and determined in this

quantification, as with all of the other claims to the use of water in Division 3.

2. Exclusive Storage Claim

Next, I deal with the right to build storage to serve Indian needs alone. I conclude that this claim must be denied.

Wyoming's Constitution forbids State jurisdiction over Indian lands. Throughout this trial and Report can be found a sustained respect for this Constitutional disclaimer. It is the reason Wyoming has not asked that the Tribes be bound by the still uncancelled State awarded water rights on nearly 87,000 acres of Indian Reservation land.[30]

It is the reason storage construction on Indian land is impossible without the express consent of the Tribes or Congress, their legal guardian. It is the reason State statutes regarding water duties, abandonment, proof of beneficial use, and numerous other matters dealing with land under water use provisions, cannot apply to the Reservation.

This same Wyoming Constitution, which guarantees the immunity from State water law to Indians lands, also ordains that the water in this State is the property of the State of Wyoming and makes no exceptions if said water is traversing Federal enclaves of any kind.

30. The United States, on behalf of the Indians, obtained significant water rights on the Reservation in accordance with Wyoming State law for the irrigation of nearly 145,000 acres. Of that amount, the rights for approximately 58,000 acres have expired for failure to submit evidence of actual use, leaving uncancelled rights for nearly 87,000 acres. A specific identification of all such rights is contained in Plaintiff's Exhibits WRIR SR-8 and SR-9. ...(continued)

To allow upstream storage and impoundment for exclusive Indian needs, without regard for the thousands of other citizens of Water Division 3 who also have a right to the use of water, would be an unconscionable act.

Facilities that would assure instream fishing flows in all of the Stream Reaches requested would of course augur well for downstream irrigators, albeit at some expense to irrigators upstream of the fisheries reaches. Facilities with exchange provisions for storage at Boysen Reservoir would largely remove this inequality; but the only way this guaranty of a full instream flow as claimed for fisheries maintenance can ever be accomplished is by the cooperation of all of the water users of Water Division 3, Indian and non-Indian alike, with all government entities involved for rapid construction of the upstream storage facilities.

One last claim, not unrelated to aesthetics and fisheries, is the Tribal request for sufficient water to maintain levels of all lakes on the Reservation "in their natural state" except Bull Lake, Ocean Lake, Boysen Reservoir, Ray Lake, Washakie Reservoir and Pilot Butte Reservoir. This includes water to maintain Washakie Reservoir at 7,000 acre-foot capacity, and Ray Lake at 7,140 acre-foot capacity.

---

30. (Continued)...For reasons set forth in several foregoing sections, the Doctrine of Election of Substantive Rights is not invoked to deny reserved rights to the United States. There is no question that, following the 1905 cession, applications were made to the State Engineer's Office. In fact, the agreement contained specific language that proceeds were to be used in part for preparing Indians and their lands for state awarded water rights. But the action of the Supreme Court, three years later, in the Winters case, rendered all such proceedings moot.

I find no basis in the law or in the evidence which warrants the granting of an implied reserved right for these purposes. While the Tribes are given wide latitude in the use of waters herein awarded, certainly they know that if intense agricultural and other consumptive uses are engaged in to the degree that levels of the lakes are reduced, it is a matter largely in the hands of the Indians to control.

The above findings will be reflected in the decree.

III. ESTOPPEL

One of the contested issues of law herein is whether the United States is estopped from claiming reserved water rights in Water Division 3. It merits a review.

Several thousand defendants, all owners of state water rights that may well be diminished in value in some degree, feel strongly that the Federal government should compensate them for said damage, or be estopped from asserting this doctrine of reserved rights, particularly for the "futures" acreage of the Wind River Indian Reservation. Many, particularly families of the settlors who were also induced to pioneer the land, feel that at least the reserved rights for future projects should be placed in abeyance until the Federal government completes upstream storage facilities and thus provide the water necessary for the coveted 1868 priority date for the proposed projects, without possible adverse effect upon their state rights.

Of the several hundred attorneys of record with clients as defendants herein, there were two[31] who responded to the call for oral arguments in advancing estoppel; and Wyoming, in briefs and proposed findings, gave the concept thorough coverage. The Copenhaver argument, reduced to its most serious and direct terms, can be paraphrased something like this:

> The United States of America induced and enticed Indians to settle upon the Reservation. The United States of America induced and enticed settlers and pioneers to develop the reclamation areas, the Carey

31. Mr. Ross Copenhaver, Tr. p. 14385-92, Worland hearings, December 9, 1981; Mr. George Radosevich, Tr. p. 14392-403, Worland hearings, December 9, 1981.

> Land Act acreage, and gave the State the right to award water rights. Lives and fortunes were spent to build works and till fields, all on reliance upon those coveted, adjudicated, proven water rights. Men were induced to start their farming operations by the acts and conduct of the United States. The United States should not now be heard to invoke the reserved right date (1868) on Reservation acreage over and above the lands historically irrigated. There was reliance placed upon state water rights by Wyoming settlers who developed those rights. The Indians developed what they could in the historics. New projects should not be given a priority date to the detriment of either the Indian or the non-Indian's established rights.

Mr. Radosevich's argument was similar, only it expanded further into the societal and moral field. It stressed the particular vulnerability of Lander, its State Training School, its hospitals - all of equal importance to Indians - if the Tribal claim for groundwater aquifer protection prevails.

I do indeed find that a Federal reserved right does exist and that, from testimony of the 39 Worland witnesses, it would be folly to draw from this finding a conclusion that no matter how gently applied, there would be no injury to existing state awarded water rights owners in the downstream remainder of Water Division 3.[32]

Wyoming and State parties urge that simple notions of fair dealing estop the United States from asserting reserved water rights inconsistent with water rights acquired under Wyoming law. It reminds me again that the United States sought and received state awarded water rights (beginning in 1905 on behalf of the Tribes), and Wyoming maintains that this led residents of Wyoming to believe that the Federal government would not assert any other right.

---

32. This finding is reflected in the testimony of Wyoming witness Fassett, and is considered in depth in the section entitled "Effect on State Water Rights", next herein.

Wyoming argues that invoking estoppel will not unduly damage the government's normal functioning, nor be of particular damage to the Tribes, for this reason: The State Engineer's office still has on record uncancelled Wyoming water rights for the irrigation of nearly 87,000 acres of Indian Reservation land. It is left to one's sense of balance that if some of these are nullified because the Indians are entitled to a reserved right for the historics (an 1868 priority for about half this acreage), then surely they can live with a 1905 priority date for the balance on the newly proposed projects, a priority date which has served the Riverton Reclamation project well since its inception.

But this line of reasoning must fail, for to recognize it would require the denial of a treaty date priority on virtually all land on which future project acres are located. This would overturn the conclusions set forth under "Boundaries and Dates", supra, and that is not appropriate for the reasons and authority cited in that section.

Although my conclusion is firm that damage may indeed result in a lesser degree, depending upon priority dates, to a few senior and territorial water rights holders, and to a larger degree to holders of junior rights, I believe the application of estoppel herein cannot be justified. It would be the imposition of a second wrong to atone for the first. It would be delaying for several more generations the hard truth that the time is now, not to be deferred or argued in court for a century more, to decide once and for all the measured effect of the Winters Doctrine in Wyoming.

This conclusion is also obliquely in order because it is Wyoming, not the United States, that has brought this law suit to adjudicate water rights, and they should be determined

accordingly now. Neither equitable apportionment, nor estoppel, are remedies open to Wyoming. Having brought this action to quantify the Federal claims, it should proceed to determine that quantification.

It is beyond the referral to even venture a method for the measurement of damages that may result once the decree herein is in place. But it is proper and important to stress that injuries may result, and that the United States is duty bound to compensate those who will be harmed. In my opinion, this harm can be minimized and held to manageable and virtually minimal proportions by the immediate construction of Blue Holes Reservoir and other relatively modest upstream storage facilities on the main stem of the Wind River.[33] These public works would be welcomed by Indian and non-Indian alike and would inure to the benefit of both entities. For example, the Bureau of Reclamation engineering reveals that Blue Holes Reservoir alone would provide a minimum annual sustained yield of 175,000 acre feet per year, a figure that is virtually enough to serve the entire five new projects containing all of the uncultivated practicably irrigable acres on the entire Reservation. With such a facility in place, there is assurance of virtually no adverse effect upon existing state water users of the Big Horn Basin.

This is dealt with more thoroughly at the end of the next section entitled "Effect on State Water Rights."

For the above reasons, I hold that estoppel is not appropriate in these proceedings.

---

33. This point was brought home in dialogue with United States witness Kersich, and with Mr. Merrill and Mr. White and other counsel many times in these proceedings.

IV. EFFECT ON STATE WATER RIGHTS

A discussion on effect upon state awarded water rights requires findings dealing with the establishment of those rights. Settlers who applied for and received early permits often perfected their ditches and diversions into adjudicated certificates to assure a source of water. Had they been induced to settle the West by some assurance of water? Is there evidence herein that Congress intended a water source and a system based upon first in time, first in right for said water users? I believe the affirmative is the case with both questions; and I believe that findings and conclusions are in order based largely upon the statutes referred to herein, to the effect that Congress intended and impliedly approved the system adopted in the territory of Wyoming, ratified by statehood which resulted in Water Division 3, and which today finds the owners of water rights in this division about to suffer damage from an inability to put their rights to full use following the implacement of an 1868 priority date for Indians in the upper reaches of the Wind River. The findings are based upon the following facts.

A. ACTS OF CONGRESS

1. The Homestead Act of 1862 first set out conditions for the settlement of unappropriated public lands in the Rocky Mountain West. It was expanded in 1916 by the Stock Raising Homestead Act to include lands previously considered unir-

rigable but suitable for grazing. I find that in Water Division 3 there are over 132,898 acres which were settled by non-Indians as a result of this legislation, between the years 1890 and 1920.[34]

2. In 1873 Congress passed the Desert Lands Act. This Act supported the recognition by Congress - every bit as impliable as the reserved rights asserted for Indians - that Congress knew water was necessary for the successful settlement of much of the land in the arid West, and further asserted the doctrine of prior appropriation. I find the Desert Land Act resulted in the settlement of approximately 23,590 acres by non-Indians in Water Division 3 - mostly between 1916 and 1925.[35]

3. I further find that in the Carey Act of 1894, Congress again recognized the importance of water and the necessity of irrigation for the successful development of arid lands, and outlined a disposal policy which resulted in the additional settlement by non-Indian settlers of approximately 75,111 acres of land in Water Division 3.[36]

4. I find that the Reclamation Act of 1902 further recognized the necessity of water for settlement in the West, and stated that any project authorized under the Act was to proceed in recognition of state laws concerning water rights. I find that in Water Division 3, over 23,000 acres were disposed of to non-Indians under this Act.[37]

---

34. Plaintiff's Exhibit DS-6; Tr. p. 11364; Plaintiff's Exhibits WRIR MV-11 and MR-11A; Tr. p. 10510.
35. Plaintiff's Exhibit DS-12; Tr. p. 11367; also Plaintiff's Exhibit VM-11A.
36. Plaintiff's Exhibit DS-17.
37. Plaintiff's Exhibit DS-21; and exhibits cited in above footnotes.

I find that the above Acts of the United States Congress resulted in approximately 255,500 acres of land in Water Division 3 being originally settled upon by the predecessors in interest of the non-Indians of this area.

B. THE WORLAND HEARING

In a system developed over nearly a hundred years and based upon the doctrine of prior appropriation, it is inevitable that the imposition of a priority date earlier than even the Territorial days of Wyoming may have an adverse effect upon the entire body of valid permits and adjudicated certificates. To what degree each is harmed depends first upon its location, upon the quantification of the newly recognized rights, and upon its particular priority.

In litigation of this magnitude, to collect, evaluate and compile facts and data for computerized results to measure and define this adverse effect was a gargantuan task which Wyoming took upon herself to perform, even though it may well have been irrelevant to the legal chore of quantifying the reserved rights. There is no way of knowing how many defendants are involved in this adjudicatory action, nor indeed of how many acres are actually affected in this regard. The acres which appear of record upon the certificates in the State Engineer's Office have been proven in the lawsuit time and again to often vary from the actual acres to which water is applied. But this is a matter which need not be addressed in this portion of the adjudication.

Some 9,000 defendants are on record as holders of approximately 25,000 adjudicated certificates. How many individuals or other entities are the holders of permits can only be

surmised. How many ranches carry as a part of their property rights a combination of each is neither required nor known.

Over strong objections from both Tribal and Federal attorneys that such evidence was not only irrelevant, but quite possibly reversible error, I ruled that a small, certain amount of evidence of status diminution and of economic effect would be permissible in this lawsuit. I was guided in that ruling by two considerations: 1) Associate Justice William H. Rehnquist, in Cappaert, supra, observed that the application of implied Federal reserved water rights must be done with sensitivity; and 2) the knowledge that if there can be a beginning now to a compilation, entitled to credence, of said adverse effect, it would undoubtedly serve a most valuable purpose to all -- Indians and non-Indians, the United States and the State of Wyoming -- in the inevitable bargaining, negotiations, planned storage legislation, and strict management procedures that are sure to follow this adjudication.

A total of 39 Wyoming citizens, all residents of Water Division 3 and directly involved herein, were allowed to testify at Worland in December, 1981, during a week reserved for evidence regarding economic impact. Their testimony is immutable proof that an imposition of an 1868 date upon Indian water rights over and above current Indian historic use may have an adverse effect on many appropriators. I so find.

C. THE FASSETT MODEL

In addition, the State employed the professional services of Mr. Gordon W. Fassett, an associate of Leonard Rice Consulting Water Engineers, a registered engineer in at least three

Western States, to set up model runs on computers originally developed to handle the entire Big Horn Basin.

Before reviewing the Fassett Model and some of its data base, it is best that I state at the outset exactly what was not concluded from this massive evidence. The "Jeff" Fassett model, as it will become known in Wyoming water law and administration, required over eight days of hearings and filled just over 2,000 pages of the transcript.[38]

38. Fassett testimony began at Transcript page 9437 and continued virtually uninterrupted through page 11621. Not all water rights that existed in Water Division 3 were cranked into the data used for the computer printouts (about 80% of acreage was used, Exhibit MF-2), but the number of certificated acres that were included in the data base was an attempt to make the conclusions more acceptable to real world conditions. Generally, the majority of certificates and permits that were left out were those associated with water rights on the uppermost reaches of the stream throughout the Basin; those on smaller draws; those associated with particular springs that would appear on individual lands, which in the opinion and from discussions with Mr. Christopulos, Mr. Fassett and his staff felt should be considered outside the bounds of rigorous administration. This eighty percent figure for the certificated areas was reduced to even sixty-five percent of the permitted areas in all of Water Division 3. As to what Tribal claims, including the contingency claims, should be given credit is not clear and it was admittedly a very difficult job. The Tribes' contingency claim of twenty percent total of all Tribes' claims said nothing about specific points of diversion and therefore, the 130,000 acre-feet involved was divided up among the various points of diversion made by the United States and the Tribes. The model was designed with virgin flows, input developed by engineers or staff under Mr. Fassett's supervision, and virgin flows were estimated near the gaging sites and were not broken down into every single individual stream throughout the Big Horn Basin. Plaintiff's Exhibit MF-4 dealt with virgin flows statistically from 1970 through 1979, the years to which the model runs were based. In this Report, a permit deals specifically with an uncancelled, ...(continued)

The Fassett model was not a basis for any finding of fact or conclusion of law. If it has probative value in this law suit, it is only as a supplemental basis for a finding of fact reported above and for which the Worland witnesses constitute the primary evidence, i.e., that the imposition of an 1868 priority upon Indian acreage over and above historic total, may have an adverse effect upon many state awarded water rights in Water Division 3.

How much of an adverse effect on the junior rights? How much of an effect on territorials? How much of an effect upon rights of users on streams located upstream from the Reservation as compared to those downstream? What adverse effect, if any possible, on streams such as the Greybull and the Shoshone on the north end of Water Division 3, which are remotely associated hydrologically with the headwaters of the Wind River?

38. (Continued)...unadjudicated and unconfirmed right to use water in Wyoming, and an adjudicated right is referred to as a certificate, or an adjudicated certificate. In the Fassett model, the word permit was a generic term used for both permits and certificates. The model developed several schedules based primarily upon collation of summaries of actual diversion records of ditches able to be obtained throughout the Big Horn River Basin. Some records were good, some records were not very good; but everything was collated that could be found on as many ditches as could be located throughout the Basin, and these records were summarized in their actual monthly diversion amounts. Between comparing both the results of monthly consumptive use studies of his work and of the work of the United States' and the Tribes' experts, and a review of ditch diversion records throughout the Basin, the witness was able to come up with a diversion pattern, month by month, that was applied to every single water right.

These and other questions naturally arise from the myriad doubts that remain from my review of the Jeff Fassett testimony, and of many of the 200 exhibits used in his model presentation.

The entire Fassett model exercise left me with a distinct feeling that the inputted assumptions were carefully crafted to secure the desired print-outs. This is not to say that there was either deception or faultiness within the practice, but it is to observe that conclusions are to be credible only if the hundreds, and in many cases thousands, of assumptions that went into the computer for each conclusion, had a relationship to real world situations. Oftentimes this was not the case, or could not in fact be the case.

The record of Fassett testimony is replete with examples where certain matters were based on "literature", or on the experience of consumption of other towns than on Fort Washakie, for example, for water consumption; that the dry year of the ten year projection was based upon statistics as to become a statistically dry year, rather than actual dry year flow figures.

The "worst, worst scenario" was obviously based upon inputs that did not compensate for the existence of state awarded permits on some 87,000 acres of Reservation land, and the record is not clear whether some or all were excluded; certainly there are state permits on 17,411 acres of the historically irrigated land. This fact, coupled with the assumptions that all Federal and Indian claims would be fully awarded and immediately exercised, put a strong measure of qualification upon the results. Mr. Fassett testified that in his opinion, though he wouldn't stake his life on it since the subject matter itself - since the very nature of the exercise must allow for a

five to fifteen percent correction factor, resulted in a total of about 800,000 acre-feet per year being the total Indian requirements under their claims. That figure is higher than can be granted if every adjusted Indian and United States claim granted were to be "optimized", as some experts say in their testimony. The water duties used were often assumed, and in the case of the Riverton Reclamation Project, if the duties used were to apply to the acreage under permit, the result would be evidence that numerous Wyoming water users are violating Wyoming law for using far in excess of the statutory quantification of one cubic foot for seventy acres permitted.

I could enumerate many more instances which left so much in doubt regarding the credibility, or the degree of effect, rather than credibility, that is to be placed with each of the model print-outs. But again let me stress that this is not to detract from the professionalism and the expertise with which Mr. Fassett and his people completed the difficult task. They engaged in verifications of input, and these were often made. They testified that hand calculations were done with engineering expertise. Logic was verified time and again to assure as best as possible relationships to real world facts.

Perhaps the overriding and lasting value to be accorded the Fassett model is that it is so structured that it can be inputted with any combination of dates, or set of Federal claims, or amounts of Federal water usage. In this way, once such matters as quantified rights, removal of twenty percent contingency claims, and other reductions, are finally adjudicated herein and beyond appeal, then perhaps officials will have available the opportunity to ask proven questions and obtain credible answers to specific unknowns which would then be capable of ready solution.

The purpose of the Fassett model evidence was to buttress the point that state water rights could be adversely affected by the imposition of a federal reserved water right dating back as far as 1868 on all Indian claims if all granted and simultaneously put into effect. That purpose was served.

It is regrettable that another purpose of the computer model print-outs was not achieved. That purpose was that under a set of assumptions involving cooperation of Wyoming officials, the Tribal authorities and the United States, the quantification of these Tribal rights could have been determined; upstream facilities planned for,[39] and an incremental

39. A document much "in evidence" at counsel tables of major parties during most of the trial, though not offered in evidence, was a publication of the Department of the Interior, Water and Power Resources Service (Bureau of Reclamation), dealing with upstream storage facilities. Both Wyoming and the United States made a copy available to me. It is entitled, "Wind River Basin Water Supply Study, Preliminary Field Draft, June, 1980." I have based no findings in this Report upon materials in this publication, but I deem it appropriate to cite from it in this section dealing with effects.

The report presented results of studies performed to determine the quantities of water in the Wind River Basin available for storage, potential storage sites, and approximate cost of water storage at each site. All studies were conducted so as to have no adverse effect upon existing water rights. This study dealt with water in addition to water released from Boysen Reservoir. No Boysen releases were shorted to make water available for upstream storage. These studies demonstrated that during periods when Boysen is not full, water could be stored at upstream locations by using an exchange system of storage between Boysen and the upstream sites. This exchange has advantages to all irrigators of Division 3: (1) there are periods when storage is available in Boysen, but cannot be diverted by upstream users due to low flow conditions; and (2) upstream storage would help eliminate periods when the Wind River is severely depleted at Riverton due to upstream diversions.

building program outlined -- all of which would have rendered conclusions to prove that all state water rights would thereby have incurred little or no adverse effect in the implantation and establishment of these quantified Indian water rights. It is a comment on the disobliging nature of our times that such an alternative use of this vast and costly exercise was not engaged in.

39. (Continued)...Nine potential storage sites were examined with summary results of hydrology, engineering, economics, and environmental matters involved. On-stream sites are designated as Brooks Lake, Blue Holes, Wiggins Reservoir, and Raft Lake. Off-stream sites are designated as Ocean Lake, Steamboat, Crowheart Butte, and Kinnear. Blue Holes is the largest of the proposed sites. In its study, a constant release of 14,500 acre-feet per month, or approximately 244 feet per second, was made from the reservoir during the operation study. The firm annual yield would be 174,000 acre-feet, a figure in excess of the totals of the remaining eight projects.

V. FINDINGS OF FACT AND CONCLUSIONS OF LAW

In general, I have found that the United States, and to a lesser degree the Tribes, have prevailed with evidence to be more persuasive at most of the significant points in this adjudication. However, particularly regarding the proof of practicable irrigability of historic lands, much of the State of Wyoming's position was found to be convincing, as it was on certain points regarding groundwater and additional Tribal futures claims.

Considering the vigor and professional expertise with which the attorneys for Wyoming conducted their case, I believe that only serious and legally meritorious contentions could have survived. To closely examine these contentions, one is referred to the body of this Report, particularly Part II (pages 87 through 217), which deals in detail with practicably irrigable acreage determinations.

As is the custom in complex stream adjudications, Findings of Fact and Conclusions of Law are of necessity determined in the body of the Report, and appear without distinction in summary form listed below. Any ambiguity or omission shall be resolved by first referring to the recommended decree herein, infra, and next to the specific section of the Report from which the following findings and conclusions have been summarized. Footnotes tying findings to evidence are also contained in the main sections.

A. BOUNDARIES AND DATES

1. The Wind River Indian Reservation, established by Treaty, July 3, 1868, lies wholly within Water Division 3 of the State of Wyoming, and its boundaries are agreed to by major parties herein. See Appendix 1, infra.

2. The Act of March 3, 1905, amended, modified and ratified the Agreement of April 21, 1904, commonly known as the Second McLaughlin Agreement, between Indian Inspector James McLaughlin on behalf of the United States, and the Shoshone and Arapahoe Tribes. Approximately 1,480,000 acres of Reservation land north of the Wind River and east of the Popo Agie were opened to disposal to non-Indians under the provisions of the homestead, townsite, coal and mineral land laws, or by sale for cash, as provided in the Act. The ceded land is described as follows:

> Beginning in the midchannel of the Big Wind River at a point where said stream crosses the western boundary of the said reservation; thence in a southeasterly direction following the midchannel of the Big Wind River to its conjunction with the Little Wind or Big Popo-Agie River, near the northeast corner of township one south, range four east; thence up the midchannel of the said Big Popo-Agie River in a southwesterly direction to the mouth of the North Fork of the said Big Popo-Agie River; thence up the midchannel of the said North Fork of the Big Popo-Agie River to its intersection with the southern boundary of the said reservation, near the southwest corner of section twenty-one, township two south, range one west; thence due west along the said southern boundary of said reservation to the southwest corner of the same; thence north along the western boundary of said reservation to the place of beginning.

3. By stipulation of the major parties, all of the aforesaid opened land, whether owned by Indians or non-Indians, is recognized as being within the boundaries of the Wind River Indian Reservation.

4. By June 12, 1914, 128,986.56 acres were sold realizing $251,642.97 for the Tribes. On April 29, 1915, the Commissioner of Indian Affairs recommended that further sales be postponed indefinitely and, on May 27, 1915, the Secretary of Interior so ordered.

5. On September 19, 1934, the Secretary of Interior temporarily withdrew further disposition of lands within the area opened by the 1905 Act.

6. Between the opening of the Reservation lands in 1905 and when further disposal of lands was discontinued, proceeds realized by the grazing leases on the opened lands were not treated as general revenues to the United States Treasury but were instead paid to or expended for the benefit of the Indians through Tribal accounts.

7. Indian title to the opened lands was not extinguished until specific plots of land were actually sold or entered, and the Department of the Interior maintained exclusive jurisdiction over grazing on opened lands which were not sold or entered.

8. Article III of the 1905 Act provided that a portion of the proceeds from the sale of opened land would be used to take such steps:

> ....as are required by the statutes of the State of Wyoming in securing water rights from said State for the irrigation of such lands as shall remain the property of said Indians, whether located within the territory intended to be ceded by this agreement or within the diminished reserve.

The Winters decision of 1908 rendered this language of no legal force or affect regarding securing state water rights. It remains as evidence of intention regarding continued ownership of ceded lands by Indians.

9. On April 17, 1940, the Secretary of the Interior, upon finding that restoration of undisposed, ceded lands to Tribal ownership would be in the Tribal interest, ordered lands not disposed of under the 1905 Act restored to the Wind River Indian Reservation.

10. The "cede, grant and relinquish" language of Article I of the 1905 Act as it related to "all right, title and interest" in the opened lands, when interpreted with the rest of the Act and other contemporary documentation, was intended by the Tribes and the United States to give the United States the right to dispose of land by sale or settlement for the benefit of the Tribes, with the United States to act as agent for the Tribes under authority generally associated with a power of attorney. Article IX of the Act established this trusteeship.

11. The extinguishment of Indian property rights must be clearly and plainly provided for by the Congress and cannot be implied. The 1905 Act does not extinguish any right to the boundaries and dates granted under this test.

12. The 1905 Act establishes a trust relationship between the Tribes and the United States, with the United States acting as the trustee for the sale of certain Indian lands to settlers.

13. For Tribal, allotted, or Indian fee land within the stipulated boundaries of the Wind River Indian Reservation which has never left Indian ownership or which has left Indian ownership but which has been reacquired by the Tribes prior

to the date of this Report, the date for the purpose of determining priority of water rights is July 3, 1868.

14. For Indian owned fee land awarded a reserved water right herein and reacquired by the Tribes after the date of this Report, the reserved right shall continue in effect.

15. For Tribal and allotted land within the stipulated boundaries of the Wind River Indian Reservation which has left Indian ownership and has been reacquired by the Tribes after the date of this Report, the date for the purpose of determining priority of water rights is the date of issuance of the state awarded water permit on said after-acquired land, if uncancelled at the time of reacquisition. If cancelled or no state rights are in effect, there are no reserved water rights for said reacquired lands.

16. Land within the Wind River Indian Reservation which has been conveyed to a non-Indian in fee, and which remains titled in non-Indian ownership as of this Report, has no establishment date for purposes of determining priority of water rights.

B. INTENT AND PURPOSES

1. The Treaty of 1868 which created the Wind River Indian Reservation provided that the Reservation be "...set apart for the absolute and undisturbed use and occupation of the Shoshonee Indians herein named, and for such other friendly tribes or individual Indians as from time to time they may be willing...to admit amongst them...", Article II.

2. Article IV of the Treaty provided that the Indians "...will make said reservations their permanent home..." and Article VI anticipated that they will "...desire to commence farming...."

3. Twenty-two years after the Reservation was established, Wyoming was admitted to the Union by an Admission Act passed by Congress on July 10, 1890. Section 1 of that Act confirmed the Wyoming Constitution.

4. Article 8 of the Wyoming Constitution addressed water and the prior appropriation system as follows:

> Article 8, Sec. 1. The water of all natural streams, springs, lakes or other collections of still water, within the boundaries of the state, are hereby declared to be the property of the state.
>
> Article 8, Sec. 3. Priority of appropriation for beneficial uses shall give the better right. No appropriation shall be denied except when such denial is demanded by the public interests.

5. No provision in the Act of Admission addresses the Treaty of 1868 or the repeal of any provision of that Treaty.

6. Article VII of the Treaty of 1868 sought to "insure the civilization of the tribes entering into this Treaty."

7. Agriculture and related uses and fishing both existed on the Wind River Indian Reservation and contributed to the food base for the Indians during much of the latter half of the nineteenth century.

8. The doctrine of implied reserved rights established by the United States Supreme Court in Winters is applicable to the Wind River Indian Reservation and dictates the conclusions herein.

9. Congress, by ratification of the Treaty of 1868, impliedly created a reserved right for water on the Wind River Indian Reservation to satisfy the purposes of that Treaty.

10. At the creation of the Wind River Indian Reservation by the Treaty of Fort Bridger on July 3, 1868, the land

within the present stipulated boundaries was vested with a priority date for that reserved right of July 3, 1868.

11. The admission of Wyoming into the Union by the Act of July 10, 1890 did not affect the preexisting implied reserved water rights of the Wind River Indian Reservation.

12. Wyoming's Constitution, which was accepted, ratified and confirmed by Congress upon Wyoming's admission to the Union, did not affect the preexisting reserved water rights of the Wind River Indian Reservation.

13. All Tribal, allotted and Indian owned fee lands located within the stipulated boundaries of the Wind River Indian Reservation that have never left Indian ownership have a priority date of July 3, 1868 upon being proven practicably irrigable acres in this adjudication.

14. All Tribal, allotted and Indian owned fee lands located within the stipulated boundaries of the Wind River Indian Reservation which have left Indian ownership but which have been reacquired by the Tribes prior to the date of this Report have a priority date of July 3, 1868 upon being proven practicably irrigable acres in this adjudication.

15. All Tribal, allotted and Indian owned fee land located within the stipulated boundaries of the Wind River Indian Reservation which has been conveyed to non-Indian ownership in fee and which remains out of Tribal or Indian ownership as of the date of this Report has no reserved water right.

16. All Indian owned fee land awarded a reserved right in this adjudication shall continue to enjoy said right so long as it is owned either by Indians in fee or by the Tribes. Conveyance of said fee lands to non-Indian ownership shall terminate said reserved water right.

17. The Wyoming Supreme Court case of Merrill v. Bishop is in harmony with the conclusion that Congress reserved a water right in creating the Wind River Indian Reservation.

18. The respective Treaty provisions of the Fort Belknap Treaty, the subject of Winters, and the Treaty of 1868 are so similar as they relate to the reserved rights question that the same congressional intent can be implied for both.

19. The evidence introduced by the State of Wyoming of letters and records of government officials and agents, intended as proof of a lack of congressional intent to reserve water, lacks any chronological perspective to address the question of congressional intent in 1868 and clearly does not meet the burden of persuasion on the subject.

20. The equal footing doctrine does not reach the existence or non-existence of reserved water rights within Wyoming.

21. The principle purpose of Congress in ratifying the Treaty of 1868 was to provide a permanent homeland for the Indians and to establish a permanent civilization on the Wind River Indian Reservation.

22. To provide water for a Wind River Indian Reservation agricultural way of life only, when the Treaty of 1868 provided as above, is to unreasonably limit the terms of the Treaty entered into by a Congress and a nation whose own history surpassed its narrow agricultural beginnings.

23. To accomplish the purpose of the Reservation, Congress impliedly reserved water for agriculture, livestock, fish and wildlife, mineral development, municipal needs, industrial development, and protection and preservation of the aesthetic natural conditions on the Wind River Indian Reservation.

C. HISTORIC LANDS

1. As Applied to Categories of Land

1. The United States' determination of practicably irrigated acreage on the historic claim is generally more experienced, accurate and reliable than that of adversary parties, although the State of Wyoming provided sufficient evidence about certain acreage to warrant a significant reduction of the total claim.

2. The United States began the major presentation of its case with the testimony of Ronald Billstein of H.K.M. Associates. The interpretation of aerial photographs between 1939 and 1979 performed by United States' experts was supplemented and checked by field inspection of every tract claimed as historically in use outside of the Federal Irrigation Projects, and by review of assessment records and delivery system maps within the Federal Irrigation Projects. The testimony of Mr. Billstein was professionally competent, credible and persuasive.

3. On-site hydrographic verification and soils classification on all lands in the historic land base was done under the direction of Albert Kersich, President of H.K.M. Associates. The testimony of Mr. Kersich on all facets of his work was professional, credible and persuasive.

4. The United States presented its case on engineering studies and water requirements in adjudicated, unadjudicated in-use, and Type VII land claims through the testimony of Thomas Stetson, President of Stetson Engineers. Dr. Woldezion Mesghinna, also of Stetson Engineers, presented similar testimony for the United States concerning the Type VIII lands claim.

5. The evidence presented by Thomas Stetson and Dr. Mesghinna is more credible and persuasive at most significant points than that introduced in opposition and rebuttal.

6. Excluding the Upper Wind Unit, the average overall efficiency of the Federal Irrigation Projects is thirty-five percent (35%). Historic overall efficiencies on non-project lands also average thirty-five percent (35%).

7. Similar to his analysis of the future projects, United States' economic feasibility expert David Dornbusch performed an economic evaluation of Type VII and VIII lands, determining the economic feasibility of each parcel. The testimony of David Dornbusch was professionally competent, credible and persuasive.

8. Irrigation of Type VII and VIII lands included in the final totals is economically feasible.

9. A benefit/cost ratio, the present value of returns from the land divided by the present value of the costs necessary to generate those returns, of less than "one" or "unity" indicates economic infeasibility.

10. The irrigation of historic lands in the final totals is clearly feasible.

11. No economic analysis was necessary, nor was one done, on adjudicated or unadjudicated in-use lands.

12. The State's case consisted mainly of review and criticism of the work performed by Federal and Tribal experts and of showing - partially successfully - that work was inadequate.

13. The methodology of United States' witnesses was competent, generally convincing, and in most cases adequate in supporting Federal claims.

14. In considering Type VII land and Indian fee potentially irrigable acres, State economic expert James Jacobs made several assumptions clearly at odds with the reality of presently existing and probable future circumstances in Water Division 3.

15. The testimony of Mr. Jacobs was inadequate to advance the State's claim that the benefit/cost ratios of the historic lands study are below unity.

16. The State of Wyoming presented Craig Sommers' testimony to show successfully that 5,017.1 acres of adjudicated lands were nonarable by United States' standards, but did not prove that water was not being beneficially applied on 12,395 acres.

17. Class 6 lands are not entitled to water rights on the same basis as Class 1 through Class 4 lands.

18. The State's review of evidence presented by the United States' experts showed 3,575.9 acres of Class 6 lands within the unadjudicated in-use claim. Class 6 land is that which does not meet the minimum standards or requirements of arabilty under the land class standards used by the Federal experts, and is therefore nonirrigable.

19. The irrigability of another 879 acres of unadjudicated in-use lands was discredited by notes in the logs of Federal experts.

20. The unadjudicated in-use totals included 1,778 acres of subirrigated land, which United States expert Billstein admitted was classified nonarable.

21. State witness Sommers pinpointed 55.6 acres more appropriately typed as idle, or Type VII, land.

22. Two parcels within the unadjudicated in-use claim are owned by non-Indians. They total 10 acres.

23. The 34,427 acres claimed by the United States as unadjudicated in-use, contains 6,298 acres not entitled to a reserved water right, which when deleted from the claim leaves 28,129 acres as the measure of the right in this category.

24. After modifications made during analysis by Federal experts, the United States' benefit/cost analysis at a 4% real rate of interest showed 7,946 acres remaining feasible out of the original Type VII claim of 8,002 acres.

25. There was a general relaxation of standards used by Federal experts in Type VII land classification.

26. The arability conclusions of Federal experts for Type VII lands had deficiencies which warranted subtracting the acres from the final totals.

27. Class 4 and Class 6 Type VII lands are too marginal to be awarded a finding of practicably irrigable, and are excluded from the Final Type VII totals. This exclusion results in the elimination of 1,546 acres from the claim with a total diversion of 7,771 acre-feet.

28. Lands which do not have sufficient depth to water table and consequently classify as wet lands, or lands which are subirrigated by seepage from adjoining irrigated lands, should not be given consideration as practicably irrigable acreage, and are denied a reserved water right.

29. Type VIII lands are within the boundaries of the Wind River Federal Irrigation Projects in the Upper Wind Unit, the Little Wind Unit and Johnstown Unit.

30. Class 4 and Class 6 Type VIII lands are too marginal to be used as a measure for a reserved right.

31. Type VIII lands and lands claimed within the Owl Creek Unit have attributes comparable to future project lands, and were analyzed in the same manner. Acres which could not

be feasibly irrigated from a strictly engineering standpoint and those which would not be economically feasible to develop were eliminated.

32. The broad assertions of Tribe's expert Higginson regarding Indian fee owned land cannot be given complete credibility. Certain assumptions upon which he based his opinion were not supported on the record. The 10,374 acres he claimed as a measure of the reserved water rights based upon individually owned Indian fee lands is therefore reduced by 4,692 acres to an award of 5,682 acres as the measure of this right.

33. The diversion requirements developed by United States expert Mesghinna and by Tribes expert Higginson are reasonable.

34. Historic diversion rates on the Wind River Indian Reservation are excessive and the efficiencies achieved by irrigators there are poor. Therefore, and in light of all the evidence, an increase of 5% in the overall efficiencies is not unreasonable or overly burdensome. Overall efficiency on the historic lands is thus increased to 40%, and the award herein is based on that figure.

35. The categories of land termed Historic herein include numerous farm fields, many a part of federal irrigation projects long established, that are rich and productive and have been the basis of agricultural life of the Reservation for decades. I find that it would be unreasonable to require an economic analysis or benefit-cost ratios on these lands as is required under future irrigation projects. The presumption of irrigability regarding these lands was fair and all parties fairly understood it.

36. There are certain adjudicated historic areas in which the testimony presented by experts for Wyoming succeeded in rebutting the presumption of practicably irrigable acreage, and totals have been reduced accordingly.

2. As Applied to Projects, Canals or River Basins

(a) Little Wind Unit

37. On the Ray Canal, the United States claimed a total 9,926 acres of land as the measure of reserved water, for a total annual diversion of 52,775 acre-feet of water. Of these acres, 514.4 acres were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 4.9 acres Type IX, or "Out" land; 10 acres Type VII, or "Idle" land; 511.9 acres Class 6 land; and 157 acres subirrigated land, all nonarable by their standards. Deleting these 1,198.2 acres from the claim leaves 8,728 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.45 acre-feet per acre to Type VIII lands, equals an award of 40,573 acre-feet of water diverted annually from Ray Canal.

38. On the Coolidge Canal, the United States claimed a total 8,029 acres of land as the measure of reserved water, for a total annual diversion of 39,754 acre-feet of water. Of these acres, 233.7 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards, and 21 acres were of a class determined by United States' economic expert Dornbusch to be economically infeasible. United States' experts found 76 acres Type IX, or "Out" land; 11 acres Type VII, or "Idle"

land; 1,196.3 acres Class 6 land; and 66 acres subirrigated land, all nonarable by their standards. Deleting these 1,604 acres from the claim leaves 6,425 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.45 acre-feet per acre to Type VIII lands, equals an award of 27,880 acre-feet of water diverted annually from Coolidge Canal.

39. On the Sub Agency Canal, the United States claimed a total 3,468 acres of land as the measure of reserved water, for a total annual diversion of 18,163 acre-feet of water. Of these acres, 16.9 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 420.4 acres Class 6 land, and 57 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 15.2 acres. Deleting these 509.5 acres from the claim leaves 2,958 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.45 acre-feet per acre to Type VIII lands, equals an award of 13,730 acre-feet of water diverted annually from Sub Agency Canal.

40. In summary, in the Little Wind Unit, the United States claimed a total 21,423 acres of land as the measure of reserved water, for a total annual diversion of 110,692 acre-feet of water. Of these acres, 765 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards, and 21 acres were of a class determined by United States ex-

pert Dornbusch to be economically infeasible. United States' experts found 80.9 acres Type IX, or "Out" land; 21 acres Type VII, or "Idle" land; 2,128.6 Class 6 land; and 705 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 15.2 acres. Deleting these 3,311.7 acres from the claim leaves 18,111 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.45 acre-feet per acre to Type VIII lands, equals an award of 82,183 acre-feet of water diverted annually from the Little Wind Unit.

(b) Upper Wind Unit

41. In the Upper Wind Unit, the United States claimed a 492 acres of land as the measure of reserved water, unspecified as to canal, for an annual diversion of 2,056 acre-feet of water. All of these acres are practicably irrigable Type VIII lands reviewed by Dr. Mesghinna, and award is made for the full amount claimed therefor.

42. On the Wind River "A" Canal, the United States claimed a total 1,118 acres of land as the measure of reserved water, for a total annual diversion of 13,483 acre-feet of water. Of these acres, 39.6 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 19.1 acres Class 6 land, nonarable by their standards, and their logs noted various reasons for the nonarability of another 115.4 acres. Deleting these 174.1 acres from the claim leaves 944 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion

requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 9,959 acre-feet of water diverted annually from Wind River "A" Canal.

43. On the Dinwoody Canal, in the Dinwoody Bench Area, the United States claimed a total 5,496 acres of land as the measure of reserved water, for a total annual diversion of 66,281 acre-feet of water. United States' experts found 37 acres Type IX, or "Out" land; and 705 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 28 acres. States' expert Sommers noted ten acres of adjudicated land on Dinwoody Canal that are more properly typed "VIII". Deleting these 780 acres from the claim leaves 4,716 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 49,754 acre-feet of water diverted annually from the Dinwoody Bench Area.

44. In summary, in the Upper Wind Unit, the United States claimed a total 7,106 acres of land as the measure of reserved water, for a total annual diversion of 81,820 acre-feet of water. Of these acres, 39.6 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 37 acres Type IX, or "Out" land; 19.1 acres Class 6 land; and 705 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 143.4 acres. State expert Sommers noted ten acres of adjudicated land on Dinwoody Canal that are more properly typed "VIII". Deleting these 954.1 acres from the claim leaves 6,152 acres as a measure of the right. Applying a 40% overall efficiency to the claimed

diversion requirement on adjudicated, unadjudicated in-use, and Type VII lands, and an average water duty of 4.45 acre-feet per acre to Type VIII lands, equals an award of 61,769 acre-feet of water diverted annually from the Upper Wind Unit.

(c) Separate Units

45. In the Johnstown Unit, the United States claimed a total 844 acres of land as the measure of reserved water, for a total annual diversion of 5,490 acre-feet of water. Of these acres, 138 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 38.9 acres Class 6 land, nonarable by their standards. Deleting these 176.9 acres from the claim leaves 667 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.45 acre-feet per acre to Type VIII lands, equals an award of 3,837 acre-feet of water diverted annually from the Johnstown Unit.

46. In the Lefthand Unit, the United States claimed a total 2,148 acres of land as the measure of reserved water, for a total annual diversion of 14,821 acre-feet of water. Of these acres, 136.2 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 12 acres Type IX, or "Out" land; 1 acre Type VII, or "Idle" land; and 789.7 acres Class 6 land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 4 acres. Deleting these 942.9 acres from the claim leaves 1,205 acres as the measure of the right.

Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 7,267 acre-feet of water diverted annually from the Lefthand Unit.

(d) Irrigation Districts

47. In the Midvale Irrigation District, the United States claimed a total 569 acres of land as the measure of reserved water, for a total annual diversion of 3,175 acre-feet of water. Eight of these acres are owned by non-Indians, and when deleted from the claim leave 561 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 2,738 acre-feet of water diverted annually from the Midvale Irrigation District.

48. In the Riverton-LeClair Irrigation District, the United States claimed a total 1,371 acres of land as the measure of reserved water, for a total annual diversion of 7,513 acre-feet of water. Of these acres, 9.6 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 93.7 acres Class 6 land, nonarable by their standards, and their logs noted various reasons for the nonarability of another 201.6 acres. Deleting these 304.9 acres from the claim leaves 1,066 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 5,117 acre-feet of water diverted annually from the Riverton-LeClair Irrigation District.

(e) Project Land Totals

49. In totaling the above summaries in project lands, the United States claimed a total 33,461 acres of land as the measure of reserved water, for a total annual diversion of 223,511 acre-feet of water. Of these acres, 1,088.4 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards, and 21 acres were of a class determined by United States expert Dornbusch to be economically infeasible. United States' experts found 129.9 acres Type IX, or "Out" land; 22 acres Type VII, or "Idle" land; 3,070 acres Class 6 land; and 985 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 364.2 acres. Eight acres are owned by non-Indians. State expert Sommers noted ten acres of adjudicated land on Dinwoody Canal that are more properly typed "VIII". Deleting these 5,698.5 acres from the claim leaves 27,762 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.45 acre-feet per acre to Type VIII lands, equals an award of 162,911 acre-feet of water diverted from the project canals.

(f) Non-Project Lands

50. Outside of the Project areas, the historic land claims fall into five areas, the Wind River Basin, the Little Wind River Basin, the Bighorn River Basin, the Popo Agie River Basin, and the Owl Creek Basin.

51. The streams serving lands within the Wind River Basin are: East Fork Wind River, Dinwoody Creek, Sand Draw, Dry Creek, Bull Lake Creek, Meadow Creek, Dry Pasup

Creek, Crow Creek, Willow Creek, and the Main Stem of the Wind River.

52. The streams serving lands within the Little Wind River Basin are: North Fork Little Wind River, South Fork Little Wind River, Main Stem Little Wind River, Mill Creek, Sage Creek, Crooked Creek, Trout Creek, Spring Creek, and Bighorn Draw.

53. The streams serving lands within the Bighorn River Basin are the Main Stem of the Bighorn River, Cottonwood Creek, Fivemile Creek, and Muddy Creek.

54. Land within the Popo Agie River Basin is served by the North Fork and the Main Stem of the Popo Agie River.

55. Within the Owl Creek Basin, the land is served by the South Fork of Owl Creek, the main Stem of Owl Creek, Mud Creek and Red Creek, Dry Muddy Creek, Maverick Springs Draw, and Roundup or Warm Springs.

(g) Wind River Basin

56. On the East Fork of the Wind River, the United States claimed a total 310 acres of land as the measure of reserved water, for a total annual diversion of 1,568 acre-feet of water. Of these acres, 41 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 9 acres Type VII, or "Idle" land, nonarable by their standards, and their logs noted various reasons for the nonarability of another 228.3 acres. Deleting these 278.3 acres from the claim leaves 32 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and

Type VII lands equals an award of 141 acre-feet of water diverted annually from the East Fork of the Wind River.

57. On Dinwoody Creek, the United States claimed a total 171 acres of land as the measure of reserved water, for a total annual diversion of 953 acre-feet of water. United States' experts found 36.9 acres Type IX, or "Out" land, nonarable by their standards. Deleting these 36.9 acres from the claim leaves 134 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 649 acre-feet of water diverted annually from Dinwoody Creek.

58. On Sand Creek, the United States and the Tribes made no claim and, therefore, no water is awarded.

59. On Dry Creek, the United States and the Tribes claimed a total 1,739 acres of land as the measure of reserved water, for a total annual diversion of 7,741 acre-feet of water. Of these acres, 3.5 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards, and their logs noted various reasons for the nonarability of another 150.9 acres. Tribal expert Higginson determined 312 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 466.4 acres from the claim leaves 1,273 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 5,584 acre-feet of water diverted annually from Dry Creek.

60. On Bull Lake Creek, the United States claimed a total 63 acres of land as the measure of reserved water, for a total annual diversion of 339 acre-feet of water. All of these acres are practicably irrigable and are awarded status as a measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 296 acre-feet of water diverted annually from Bull Lake Creek.

61. On Meadow Creek, the United States and the Tribes claimed a total 683 acres of land as the measure of reserved water, for a total annual diversion of 3,477 acre-feet of water. United States' experts found 3.5 acres Class 6 land, nonarable by their standards, and their logs experts noted various reasons for the nonarability of another 10 acres. Deleting these 13.5 acres from the claim leaves 680 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 to Indian owned lands, equals an award of 3,125 acre-feet of water diverted annually from Meadow Creek.

62. On Dry Pasup Creek, the United States claimed a total 2,148 acres of land as the measure of reserved water, for a total annual diversion of 11,370 acre-feet of water. Of these acres, 77.2 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 74 acres Type IX, or "Out" land, and 267 acres Type VII, or "Idle" land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 180 acres. Deleting these 598.2 acres from the claim leaves 1,550 acres as the measure of the right. Applying a 40% over-

all efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 7,179 acre-feet of water diverted annually from Dry Pasup Creek.

63. On Crow Creek, the United States claimed a total 3,117 acres of land as the measure of reserved water, for a total annual diversion of 16,551 acre-feet of water. Of these acres, 31.1 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 180 acres Type VII, or "Idle" land, and 401.1 acres Class 6 land, all nonarable by their standards. Deleting these 612.2 acres from the claim leaves 2,505 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 11,646 acre-feet of water diverted annually from Crow Creek.

64. On Willow Creek, the United States and the Tribes claimed a total 243 acres of land as the measure of reserved water, for a total annual diversion of 1,136 acre-feet of water. United States' experts found 2 acres Type VII, or "Idle" land, and 6.5 acres Class 6 land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 41 acres. Deleting these 49.5 acres from the claim leaves 194 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 876 acre-feet of water diverted annually from Willow Creek.

65. On the Main Stem of the Wind River, the United States and the Tribes claimed a total 7,784 acres of land as the measure of reserved water, for a total annual diversion of 36,985 acre-feet of water. United States' experts found 17.2 acres Type IX, or "Out" land, 31 acres Type VII, or "Idle" land, and 379.3 acres Class 6 land, all nonarable by their standards. Tribal expert Higginson determined 2,912 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Two acres are owned by non-Indians. Deleting these 3,341.5 acres from the claim leaves 4,442 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 20,842 acre-feet of water diverted annually from the Main Stem of the Wind River.

66. In summary, in the Wind River Basin, the United States claimed a total 16,258 acres of land as the measure of reserved water, for a total annual diversion of 80,120 acre-feet of water. Of these acres, 152.8 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 128.1 acres Type IX, or "Out" land; 489 acres Type VII, or "Idle" land; and 790.4 acres Class 6 land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 610.2 acres. Two acres are owned by non-Indians. Tribal expert Higginson determined 3,224 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 5,396.5

acres from the claim leaves 10,873 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned fee lands, equals an award of 50,338 acre-feet of water diverted annually from the Wind River Basin.

(h) Little Wind River Basin

67. On the North Fork of the Little Wind River, the United States and the Tribes claimed a total 2,984 acres of land as the measure of reserved water, for a total annual diversion of 15,325 acre-feet of water. Of these acres, 254.9 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 48.4 acres Class 6 land, and 600 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 332.9 acres. Tribal expert Higginson determined 36 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 1,272.2 acres from the claim leaves 1,712 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 to Indian owned lands, equals an award of 7,961 acre-feet of water diverted annually from the North Fork of the Little Wind River.

68. On the South Fork of the Little Wind River, the United States and the Tribes claimed a total 1,402 acres of land as the measure of reserved water, for a total annual diversion of 6,977 acre-feet of water. Of these acres, 85.7 were of a

class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 186 acres subirrigated land, nonarable by their standards and their logs noted various reasons for the nonarability of another 11 acres. Tribal expert Higginson determined 7 acres of Indian fee land to be "potentially irrigable, but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 289.7 acres from the claim leaves 1,113 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 5,085 acre-feet of water diverted annually from the South Fork of the Little Wind River.

69. On the Main Stem of the Little Wind River, the United States and the Tribes claimed a total 1,987 acres of land as the measure of reserved water, for a total annual diversion of 10,856 acre-feet of water. Of these acres, 95.5 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. The logs of United States' experts noted various reasons for the nonarability of 64 acres. Tribal expert Higginson determined 208 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 367.5 acres from the claim leaves 1,620 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 8,177 acre-

feet of water diverted annually from the Main Stem of the Little Wind River.

70. On Mill Creek, the United States claimed a total 47 acres of land as the measure of reserved water, for a total annual diversion of 262 acre-feet of water. Of these acres, 9.7 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 9 acres Type VII, or "Idle" land, nonarable by their standards. Deleting these 18.7 acres from the claim leaves 28 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 136 acre-feet of water diverted annually from Mill Creek.

71. On Sage Creek, the United States and the Tribes claimed a total 2,159 acres of land as the measure of reserved water, for a total annual diversion of 11,690 acre-feet of water. United States' experts found 21.6 acres Type IX, or "Out" land; 17 acres Type VII, or "Idle" land; and 27.4 acres Class 6 land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 84.5 acres. Tribal expert Higginson determined 212 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 362.5 acres from the claim leaves 1,797 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 8,686 acre-feet of water diverted annually from Sage Creek.

72. On Crooked Creek, the United States claimed a total 72 acres of land as the measure of reserved water, for a total annual diversion of 380 acre-feet of water. Of these acres, 2.6 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. Deleting these 2.6 acres from the claim leaves 69 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 317 acre-feet of water diverted annually from Crooked Creek.

73. On Trout Creek, the United States and the Tribes claimed a total 291 acres of land as the measure of reserved water, for a total annual diversion of 1,567 acre-feet of water. Of these acres, 63 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. Deleting these 63 acres from the claim leaves 228 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 1,088 acre-feet of water diverted annually from Trout Creek.

74. On Spring Creek, the United States claimed a total 178 acres of land as the measure of reserved water, for a total annual diversion of 885 acre-feet of water. All of these acres are practicably irrigable and are awarded status as a measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 773 acre-feet of water diverted annually from Spring Creek.

75. On Bighorn Draw, the United States claimed a total 139 acres of land as the measure of reserved water, for a total annual diversion of 687 acre-feet of water. All of these acres are practicably irrigable and are awarded status as a measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 600 acre-feet of water diverted annually from Bighorn Draw.

76. In summary, in the Little Wind River Basin, the United States claimed a total 9,259 acres of land as the measure of reserved water, for a total annual diversion of 48,629 acre-feet of water. Of these acres, 511.4 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 21.6 acres Type IX, or "Out" land; 26 acres Type VII, or "Idle" land; 75.8 acres Class 6 land; and 786 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 492.4 acres. Tribal expert Higginson determined 463 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 2,376.2 acres from the claim leaves 6,884 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 32,823 acre-feet of water diverted annually from the Little Wind River Basin.

(i) Bighorn River Basin

77. On the Main Stem of the Bighorn River, the United States and the Tribes claimed a total 126 acres of land as the measure of reserved water, for a total annual diversion of 749 acre-feet of water. United States' experts found 11 acres Type VII, or "Idle" land, and 61 acres Class 6 land, all nonarable by their standards. Deleting these 72 acres from the claim leaves 54 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 280 acre-feet of water diverted annually from the Main Stem of the Bighorn River.

78. On Cottonwood Creek, the United States claimed a total 942 acres of land as the measure of reserved water, for a total annual diversion of 5,368 acre-feet of water. Of these acres, 47.7 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 14.7 acres Type IX, or "Out" land, 58 acres Type VII, or "Idle" land, and 10 acres Class 6 land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 122 acres. Deleting these 252.4 acres from the claim leaves 689 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 3,548 acre-feet of water diverted annually from Cottonwood Creek.

79. On Fivemile Creek, the United States claimed a total 518 acres of land as the measure of reserved water, for a total annual diversion of 2,885 acre-feet of water. United States'

experts found 95.3 acres Class 6 land, nonarable by their standards. Deleting these 95.3 acres from the claim leaves 423 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 2,055 acre-feet of water diverted annually from Fivemile Creek.

80. On Muddy Creek, the United States claimed a total 4,281 acres of land as the measure of reserved water, for a total annual diversion of 23,485 acre-feet of water. Of these acres, 1.9 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 10 acres Type IX, or "Out" land, 143 acres Type VII, or "Idle" land, and 832.4 acres Class 6 land, all nonarable by their standards. Deleting these 987.3 acres from the claim leaves 3,293 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 15,819 acre-feet of water diverted annually from Muddy Creek.

81. On Dry Creek and Maverick Creek, the Tribes claimed a total of 371 acre-feet of water, with no supporting measuring acreage. Insufficient basis for this claim was shown, thus no award is made in this instance.

82. On Roundup or Warm Springs, the Tribes claimed a total 135 acres of land as the measure of reserved water, for a total annual diversion of 249 acre-feet of water. Tribal expert Higginson determined 100 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 100 acres from the claim leaves 35 acres as the measure of the

right. Applying an average water duty of 4.57 acre-feet per acre for Indian lands to this claim equals an award of 153 acre-feet of water diverted annually from Roundup or Warm Springs.

83. In summary, in the Bighorn River Basin, the United States claimed a total 6,002 acres of land as the measure of reserved water, for a total annual diversion of 33,107 acre-feet of water. Of these acres, 49.6 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standard. United States' experts found 24.7 acres Type IX, or "Out" land; 212 acres Type VII, or "Idle" land; and 998.7 acres Class 6 land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 122 acres. Tribal expert Higginson determined 100 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 1,507 acres from the claim leaves 4,494 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 21,855 acre-feet of water diverted annually from the Bighorn River Basin.

(j) Popo Agie River Basin

84. On the North Fork of the Popo Agie River, the Tribes claimed a total 534 acres of land as the measure of reserved water, for a total annual diversion of acre-feet of water. Of these acres, 14.1 were of a class determined by United States' experts to be economically infeasible because of

failure to meet the United States' size or arability standards. United States' experts found 42 acres Type IX, or "Out" land; 1 acre Type VII, or "Idle" land; and 5 acres Class 6 land, all nonarable by their standards. Deleting these 62.1 acres from the claim leaves 472 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 2,231 acre-feet of water diverted annually from the North Fork of the Popo Agie River.

85. On the Main Stream of the Popo Agie River, the United States and the Tribes claimed a total 134 acres of land as the measure of reserved water, for a total annual diversion of 736 acre-feet of water. United States' experts found 8.9 acres Type IX, or "Out" land; 27.3 acres Class 6 land; and 7 acres subirrigated land, all nonarable by their standards. Tribal expert Higginson determined 20 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 63.2 acres from the claim leaves 71 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 347 acre-feet of water diverted annually from the Main Stem of the Popo Agie River.

86. In summary, in the Popo Agie River Basin, the United States and the Tribes claimed a total 668 acres of land as the measure of reserved water, for a total annual diversion of 3,623 acre-feet of water. Of these acres, 24.8 were of a class determined by United States' experts to be economically

infeasible because of failure to meet the United States' size or arability standard. United States' experts found 50.9 acres Type IX, or "Out" land; 1 acre Type VII, or "Idle" land; 32.3 acres Class 6 land; and 7 acres subirrigated land, all nonarable by their standards. Tribal expert Higginson determined 20 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 125.3 acres from the claim leaves 543 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 2,578 acre-feet of water diverted annually from the Popo Agie River Basin.

(k) Owl Creek Basin

87. On the South Fork of Owl Creek, the United States claimed a total 2,013 acres of land as the measure of reserved water, for a total annual diversion of 10,519 acre-feet of water. Of these acres, 12.9 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 281.3 acres Type IX, or "Out" land; 32 acres Type VII, or "Idle" land; and 688.9 acres Class 6 land, all nonarable by their standards. Deleting these 1,015.1 acres from the claim leaves 998 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.45 acre-feet per acre to Type VIII lands, equals an award of 4,455 acre-feet of water diverted annually from the South Fork of Owl Creek.

88. On the Main Stem of Owl Creek, the United States and the Tribes claimed a total 2,875 acres of land as the measure of reserved water, for a total annual diversion of 15,212 acre-feet of water. United States' experts found 246.3 acres Type IX, or "Out" land; 28 acres Type VII, or "Idle" land; and 499.4 acres Class 6 land, all nonarable by their standards. Tribal expert Higginson determined 32 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 805.7 acres from the claim leaves 2,069 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 9,775 acre-feet of water diverted annually from the Main Stem of Owl Creek.

89. On Mud Creek, the United States claimed a total 979 acres of land as the measure of reserved water, for a total annual diversion of 5,288 acre-feet of water. Of these acres, 11.9 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 74.6 acres Type VII, or "Idle" land, and 125.7 acres Class 6 land, all nonarable by their standards. Deleting these 212.2 acres from the claim leaves 766 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands equals an award of 3,620 acre-feet of water diverted annually from Mud Creek.

90. On Red Creek, the Tribes claimed a total 104 acres of land as the measure of reserved water, for a total annual

diversion of 453 acre-feet of water. Tribal expert Higginson determined 104 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 104 acres from the claim leaves -0- acres as the measure of the right, and no award is made therefor.

91. In summary, in the Owl Creek Basin, the United States and the Tribes claimed a total 5,971 acres of land as the measure of reserved water, for a total annual diversion of 31,472 acre-feet of water. Of these acres, 24.8 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 527.6 acres Type IX, or "Out" land; 134.6 acres Type VII, or "Idle" land; and 1,314 acres Class 6 land, all nonarable by their standards. Tribal expert Higginson determined 136 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 2,137 acres from the claim leaves 3,833 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, an average water duty of 4.45 acre-feet per acre to Type VIII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 17,850 acre-feet of water diverted annually from the Owl Creek Basin.

(1) Non-Project Land Totals

92. In totaling the above summaries, in the non-project lands, the United States and the Tribes claim a total 38,158 acres of land as the measure of reserved water, for a total

annual diversion of 196,951 acre-feet of water. Of these acres, 752.7 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards. United States' experts found 752.9 acres Type IX, or "Out" land; 862.6 acres Type VII, or "Idle" land; 3,211.2 acres Class 6 land; and 793 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 1,224.6 acres. Two acres are owned by non-Indians. Tribal expert Higginson determined 3,943 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 11,542 acres from the claim leaves 26,627 acres as the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, an average water duty of 4.45 acre-feet per acre to Type VIII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned fee lands, equals an award of 125,444 acre-feet of water diverted annually from the river basins.

93. The United States and Tribes seek a reserved water right for land known as the Arapahoe Ranch and the Padlock Ranch. The reserved right priority date sought is the date of acquisition of these lands. All these parcels of land are outside of the stipulated Reservation boundaries. There is no evidence of a Congressional Act or Executive Order establishing a reservation of the lands of the Arapahoe Ranch and the Padlock Ranch purchases.

94. A reserved water right can only be granted upon acreage which is contained within the boundaries that have been stipulated by parties hereto as the boundaries of the Wind

River Indian Reservation. For this reason the claim for a reserved water right for the Arapahoe Ranch and Padlock Ranch acreage is denied. This denial in no way affects the United States' right to the use of water on the ranches pursuant to existing certificates of appropriation or uncancelled permits issued by the State of Wyoming upon which the United States or the Tribes elect to rely.

3. Recapitulation

95. A recapitulation of the foregoing findings on all categories of Historic Lands, including Indian fee land, is as follows:

96. The United States and the Tribes claim an overall total of 71,619 acres of land as the measure of reserved water, for a total annual diversion of 420,462 acre-feet of water. Of these acres, 1,841.1 were of a class determined by United States' experts to be economically infeasible because of failure to meet the United States' size or arability standards, and 21 acres were of a class determined by United States expert Dornbusch to be economically infeasible. United States' experts found 882.8 acres Type IX, or "Out" land; 884.6 acres Type VII, or "Idle" land; 6,281.2 acres Class 6 land; and 1,778 acres subirrigated land, all nonarable by their standards, and their logs noted various reasons for the nonarability of another 1,588.8 acres. Ten acres are owned by non-Indians. State expert Sommers noted ten acres of adjudicated land on Dinwoody Canal that are more properly typed "VIII". Tribal expert Higginson determined 3,943 acres of Indian fee land to be "potentially irrigable", but insufficient showing was made that comparable acreage had been successfully irrigated. Deleting these 17,240.5 acres from the claim leaves 54,389 acres as

the measure of the right. Applying a 40% overall efficiency to the claimed diversion requirement on adjudicated, unadjudicated in-use and Type VII lands, an average water duty of 4.45 acre-feet per acre to Type VIII lands, and an average water duty of 4.57 acre-feet per acre to Indian owned lands, equals an award of 288,355 acre-feet of water diverted annually from both the project canals and the non-project river basins.

D. FUTURE LANDS

1. The reservation of water for the Wind River Indian Reservation was intended to satisfy the future needs of the Indians as well as the present needs by granting sufficient water to irrigate future projects constructed on practicably irrigable acreage or use of the same as the measure of said future needs.

2. A land classification and drainage investigation was conducted on the Wind River Indian Reservation by HKM Associates on undeveloped future lands under the direction and control of A. T. Kersich. Mr. Kersich is President of HKM and principal in charge of its water resources section. He has had considerable experience in arable land studies on other Indian reservations and testified as a similar project leader and expert witness for the United States in Arizona v. California, where his testimony formed one basis for the Master's opinion. I find Mr. Kersich to be a qualified and credible expert in the areas of his testimony.

3. The "future" lands lie outside the boundaries of the Wind River Federal Irrigation Project, the Midvale Irrigation District, and the LeClair Irrigation District Project, and have no history of irrigation. They are all located within the stipulated boundaries of the Wind River Indian Reservation.

4. The State of Wyoming presented two witnesses to contest the methods and conclusions of the HKM soils experts. The first of these was Clarence Fowkes, who was admitted as an expert in soils science. The second was Craig Sommers, who was admitted as a soils scientist and an agronomist.

5. One definition of PIAs (practicably irrigable acres) was stipulated to by the United States, the Tribes and the State of Wyoming to be "those acres susceptible to sustained irrigation at reasonable costs".

6. The Tribes contended that a separate second test for practicably irrigable acreage is whether the lands in question and the proposed irrigation projects are similar to other lands and projects actually in operation in the West which have sustained long term irrigation. As to the five project areas presented by the United States being feasible, I find it unnecessary to consider the second test of the Tribes given my findings and conclusions regarding arability, irrigability, and economic via benefit-cost analysis, altogether a much stronger first test.

7. The land classification and drainage study conducted by the United States included soil analysis, drainage investigation, topographical and geological considerations, climate data, water availability determination, cropping patterns, and irrigation system designs. The land classification standards developed were applied both to lands susceptible of gravity irrigation and to lands capable of sprinkler irrigation.

8. The claimants for a reserved water right must establish their case by a preponderance of the evidence, which is the appropriate standard of proof in this matter.

9. "Arable lands" are those lands which are capable of sustained irrigation or which can sustain long-term irrigation.

10. The United States relied upon facts and data from the Bureau of Indian Affairs, the Bureau of Reclamation (also known as the Water and Power Resources Service), and the Soil Conservation Service, as well as new data compiled by its experts, in presenting its arability determination.

11. The United States' experts developed six study areas for its land classification consisting of approximately 490,000 acres.

12. The preliminary land classification study analyzed the land capability criteria of depth to barrier, water holding capacity, permeability, slope and texture to establish the study areas. This was done in a persuasive and credible fashion.

13. The United States classified the lands in the six study areas into six classes, segregating lands with similar characteristics into the same class with a reasonable degree of consistency and objectivity.

14. Factors considered by the United States in its land classification include soil texture, depth, moisture retention, alkalinity, salinity, surface gravel and cobble, slope, irrigation pattern and field size, level of the surface, surface cover, drainage, hydraulic conductivity and soil depth to barrier.

15. The United States' classification relied on land classifiers who had collectively more than 96 years of experience in the field and who augered and logged 197 borings between 5 and 10 feet, 357 borings of 5 feet or less, dug 9 backhoe pits, drilled and logged 117 deep holes, analyzed samples from 165 holes for soil chemistry, and ran 11 infiltration and 22 hydraulic conductivity tests.

16. Experts for the State of Wyoming reviewed the HKM data, but spent limited time in the field on the Reservation. The thrust of their testimony was to question the amount of

arable land HKM identified. Mr. Fowkes' testimony was general in nature, and he presented no acreage totals he felt should be deleted from those identified as arable by HKM.

17. Some degree of error inevitably exists whenever a group of land classifiers are required to coordinate and analyze such a complex area as the Wind River Indian Reservation, relying on a field of expertise which, by its nature, lacks the certainty of mathematical perfection or of objectivity.

18. Ten to fifteen percent is an appropriate reduction of the classified lands of the United States to account for the error and inaccuracy described above.

19. The United States met its burden of proof in establishing the land base for the determination of arability.

20. It is not a prerequisite in establishing a land classification that each and every tract, plot and parcel of land have a complete record of borings, diggings and testings.

21. A classification for arable land does not require consideration of economics to meet the test of practicably irrigable acreage so long as economics is considered elsewhere in the PIA determination.

22. The following acreage totals satisfy arable land base determinations for future projects:

Area	Acres
North Crowheart	43,089
South Crowheart	7,187
Big Horn Flats	17,681
Riverton East	4,223
Owl Creek	223
Arapahoe	3,614
TOTAL	76,017

23. The Owl Creek Unit is a small project and was discussed by Dr. Mesghinna in conjunction with his testimony

regarding Type VIII land. Findings regarding Owl Creek are therefore included among the findings regarding Type VIII lands under "Historics".

24. Dr. Mesghinna of Stetson Engineers testified for the United States on engineering feasibility. The Tribes offered additional evidence from Keller Engineers and the State of Wyoming relied on the testimony from Banner and Associates.

25. The testimony of Dr. Mesghinna on the factors relating to engineering feasibility was a thorough, professional presentation and analysis of the subject. He is a supervising engineer for Stetson Engineers, specializing in irrigation systems design, drainage and hydrology. He is a well qualified expert in irrigation systems design and engineering, irrigation construction costs, drainage and water requirements.

26. The Federal parties' testimony on elevation distinctions, cropping patterns, water availability, soil characteristics, market factors and other product transportation, is reasonable and persuasive.

27. The calculations by Dr. Mesghinna of the net irrigation requirement, costs and designs for the on-farm system, the pipe network, pumps and pumping plants, canals and related structures, drainage, and operation and maintenance are reasonable and supported by a preponderance of the evidence.

28. The Tribes assert through Keller Engineers that the designs and costs of Dr. Mesghinna were more expensive than necessary to accomplish the desired irrigation projects. They maintain investment and operating costs could be significantly reduced with alternative design features, lower operating pressures, and life cycle optimizing techniques, and contend that the natural drainage capacity of the lands was underestimated and that the drainage system design proposed by Dr.

Mesghinna was more intensive than necessary. I find this not persuasive.

29. The major point of disagreement from the experts for the State of Wyoming was with Dr. Mesghinna's engineering and contingencies costs, with Mr. Sostrom for the State using 35% as his cost, while Dr. Mesghinna used 25%. Mr. Sostrom also added 8% for mobilization.

30. The thorough approach of Dr. Mesghinna exhibited an independence detached from preconceived estimates of what should be the result and is supported by a preponderance of the evidence as the most reasonable conclusions on engineering feasibility.

31. Dr. Mesghinna's acreage totals must be reduced to reflect the reduction made in the arable land base determination of HKM but to account for the 5% reduction already made by him in his analysis.

32. The following acreage totals satisfy the engineering feasibility determination for the future projects:

Area	Acres
North Crowheart	34,993
South Crowheart	4,238
Arapahoe	3,437
Riverton East	3,442
Big Horn Flats	2,410
TOTAL	48,520

33. In his determination of diversion requirements, Dr. Mesghinna considered average wind velocity, water holding capacity, cropping patterns, root depths, type of delivery and conveyance systems planned, source of water, conveyance distance, amount and velocity of water in the canals, efficiencies and management techniques.

34. The United States claimed a total diversion requirement of 209,372 acre-feet while the State of Wyoming claimed it should not exceed 180,424.3 acre-feet.

35. The United States claim for unit diversion and total diversion is reasonable and supported by convincing and the better evidence, particularly since Dr. Mesghinna's average water duty is more restrictive than the present historic use in Water Division 3.

36. Numerous witnesses testifying in Worland presented evidence of greater use than that claimed by the United States and their testimony indirectly supports the above Findings and Conclusion in that regard.

37. The total diversion requirement must still be reduced by the 10% factor for error and inaccuracy from the arable land base. Thus, the total diversion for each of the future projects is as follows:

Project	Total Diversion (acre-feet/year)
North Crowheart	133,324
South Crowheart	18,181
Arapahoe	15,088
Riverton East	15,837
Big Horn Flats	6,507
TOTAL	188,937

38. The United States, through the testimony of Mr. Dornbusch, presented an economic feasibility analysis for the "at a reasonable cost" aspect of the practicably irrigable acreage test. Mr. Dornbusch is both a graduate engineer and an economist. He is experienced in feasibility studies for irrigated agriculture and other agricultural industries. He has performed large scaled agricultural feasibility studies both in this country and abroad.

39. The State of Wyoming followed the benefit-cost ratio approach, but maintained that none of the future projects would be economically feasible.

40. Dr. James Jacobs, for the State of Wyoming, performed an economic analysis of the projects. Dr. Jacobs is a professor of agricultural economics at the University of Wyoming. His experience has primarily been with the economic effect of varying agricultural practices. He has had experience with crop budgets.

41. The cropping patterns developed by Mr. Dornbusch from a variety of sources were reasonable and supported by a preponderance of the evidence. His crop yields were supported by a variety of sources in the evidence and were reasonable, as were his crop prices.

42. The determination by the experts for the State of Wyoming of production costs based on a 320 acre farming unit is unrealistic in light of the proposed future projects and unreasonably inflates the production cost estimate.

43. Mr. Dornbusch's approach to estimating prices, useful life and hours of use for the farm machinery was reasonable, supported by the preponderance of the evidence, and was more realistic than the alternative evidence.

44. Mr. Dornbusch analyzed the employment outlook for Indians on the Wind River Indian Reservation and concluded some opportunity costs for labor and management could be reduced or eliminated given the historically high rate of unemployment on the Reservation.

45. A high percentage of unemployment exists on the Wind River Indian Reservation and the preponderance of the evidence clearly supports the position of the United States on farm labor costs as well as management costs.

46. The incremental, or ten year phase-in of management personnel from the Indian labor force by Mr. Dornbusch is reasonable and supported by a preponderance of the evidence, and ignoring such a training program can only unreasonably inflate the management cost estimates.

47. The normalization factor used by Mr. Dornbusch for prices and costs is supported by a preponderance of the evidence and is representative of current practices.

48. The United States, the State of Wyoming, and the Tribes all presented experts and testimony on the appropriate discount rate to use in the economic feasibility analysis.

49. In determining the appropriate discount rate, the relevant considerations are the opportunity cost of capital displaced from investment and consumption in the long term and social time preference.

50. Mr. Dornbusch for the United States selected a range of two to four percent as the correct discount rate. He used four percent as a conservative figure in his analysis.

51. Dr. Stephen Goldfeld, on rebuttal as a witness for the United States, testified that an appropriate range would be from one to four percent, with two and one-half as a single rate to use. Dr. Goldfeld is the head of the Department of Economics at Princeton University and has served on the staff and as an appointed member of the President's Council of Economic Advisors. Real rates of interest and costs of capital are at the center of his area of specialization.

52. Dr. David Brookshire for the State of Wyoming testified that a range of four to eleven percent should be used and that no single rate should be selected.

53. Dr. Ronald Cummings for the Tribes questioned whether discounting was necessarily proper in evaluating the

future needs of the Wind River Indian Reservation, but concluded that he would select a range of two to four percent as appropriate.

54. The preponderance of the evidence clearly supports as reasonable the discount rate used by the United States in its economic analysis.

55. Mr. Dornbusch concluded, after applying a four percent discount rate in his feasibility study, that the five projects designed by Dr. Mesghinna were economically feasible. He provided the following benefit-cost figures:

Project	B-C Ratio
North Crowheart	1.47
South Crowheart	1.29
Big Horn Flats	1.07
Riverton East	1.25
Arapahoe	1.53

56. Dr. Goldfeld's analysis of the Fraumeni-Jorgenson article, "Rates of Return by Industrial Section in the United States, 1948-76," and his position on opportunity cost of capital was more persuasive than that of Dr. Brookshire and is supported by the more persuasive evidence as the better reasoning.

57. A conclusion of an economic or sensitivity analysis on the Wind River Indian Reservation that none of the proposed project lands are economically feasible is refuted by the evidence of the case and is so contrary to the conditions of the Reservation that it lacks any probative value.

58. Mr. Willard Wilson, Chairman of the Board of a bank in Thermopolis, testified that an appropriate net, inflation-proof profit margin would be one-half to three percent in

banking, which is financial analysis evidence that supports in part the above findings.

59. The claimants for a reserved water right have established their asserted case by a "preponderance of the evidence", which is the standard of proof clearly appropriate in this matter.

60. Future lands found to be practicably irrigable and therefore deserving of an award of a reserved water right as listed are as follows:

Project	Acreage	Unit Diversion (acre-feet/acre)	Total Diversion (acre-feet/acre)
North Crowheart	34,993	3.81	133,324
South Crowheart	4,238	4.29	18,181
Arapahoe	3,437	4.39	15,088
Riverton East	3,442	4.60	15,837
Big Horn Flats	2,410	2.70	6,507
TOTAL	48,520		188,937

E. ADDITIONAL TRIBES' FUTURES

1. The Tribes presented the testimony of Lyman Willardson, Ronald Bliesner and Jack Keller in support of their additional claim for practicably irrigable acreage on Stagner Ridge and additional land in Big Horn Flats.

2. The Tribal testimony generally concluded that the Stetson conceptual irrigation plan was more elaborate than necessary and therefore too costly.

3. The analysis performed by Dr. Willardson was cursory and a very small amount of time was actually spent in field investigation.

4. Experts for the United States, namely Stetson Engineers and Dornbusch and Company, also evaluated the additional future acreage and excluded it from their final totals.

5. The Tribes advanced a claim that the additional future lands would be economically feasible by reducing the planned drainage of Dr. Mesghinna and passing that cost saving to the additional acreage.

6. The drainage plan proposed by Stetson is reasonable and any reduction in it jeopardizes the chance for proper drainage of the proposed projects.

7. The additional claims for future acreage on Stagner Ridge and Big Horn Flats Extension must be denied because they fail to meet the test of practicably irrigable acreage and do not meet the burden of proof generally from the evidence introduced.

F. GROUNDWATER

1. An evaluation of the resources was made for the United States by Oliver Page, an expert in hydrogeology and groundwater uses. Similarly, Robert Brogden, a groundwater geologist, testified for the State.

2. To determine presence and extent of groundwater, Mr. Page identified the geology and conducted pump tests to measure well pumping rates and groundwater levels.

3. The testimony of Mr. Page and the evidence presented warrants the conclusion that there is abundant groundwater supply in virgin condition on the Wind River Indian Reservation.

4. The principal source of water saturating the alluvium is surface water from streams flowing over the alluvium

deposits, and this geologic fact requires certain limitations upon the use of the groundwater.

5. I find that Mr. Page's estimated well yields were professional and consistent with the practice of others in his profession, and that his reliance upon U.S.G.S. data for certain well fields was reasonable and consistent.

6. The Indians have the right to the use of the groundwater in the various aquifers beneath the land which is theirs, in trust or in fee.

7. The mineral resources and corresponding water supply requirements detailed in footnote 1 on page 220 of this Report are found to be reasonable, but the sources will not apply to additional volumes of water needed to meet the future needs.

8. The deeper aquifers are to be the source for future industrial expansion so that the recharging of aquifers and present and future surface flows will not be endangered.

9. The Cappaert doctrine is applicable only if the purpose for which the Wind River Indian Reservation was created is threatened with defeat through the use of groundwater by non-Indians around and within the Reservation. That is not the situation in this case.

10. There is nothing in Cappaert law, or in the Winters concept, or in the evidence of this long proceeding, which warrants a right to the Tribes to impinge upon the groundwater users of adjoining areas, or those of fee owned inholdings within the boundaries of the Reservation.

11. A mineral reservation results from the explicit language of a statute; an implied reservation of water does not. Consequently, a reserve mineral clause in withdrawals is a

matter of public record, and is consistent with patents which were issued to the settlers on the ceded lands.

12. The reserved right does not assure the Tribes the use of replenishable groundwater.

13. The water in the aquifers which occur in the formations is a constantly changing amorphous body and is transient in its nature, unlike land.

14. There is sufficient groundwater on the Reservation for present uses, and future increases in water uses for municipal, domestic and commercial purposes may be met without the use of surface water.

15. The proposed mineral and resource developments include the enhanced recovery work at two oil fields, natural gas processing where existing needs are currently being met, a coal mine, an electric generating station, a phosphate rock mine, one anhydrous ammonia plant, a phosphate rock beneficiation and acid production plant, and a wall board manufacturing operation plant. These proposed uses should rely on the Madison and other "deeper" sources, rather than on the Wind River aquifer and other terrace and shallow aquifers.

16. A preponderance of the evidence supports the conclusion that unregulated development of shallow groundwater would so lower aquifers of the alluvium, such as the Wind River formation, and other shallow structures adjacent to the Wind River, that irreparable harm will result to all users relying upon the Wind River for existence.

17. Mr. Merchant, for the United States, testified to estimations of Indian population growth and the present and projected need for water for municipal, domestic and commercial purposes. I find his study is reasonable and supported by a preponderance of the evidence.

18. In order to protect the Wind River aquifer and other groundwater formations from irreparable damage, the exporting of groundwater outside the stipulated boundaries of the Reservation is denied.

19. The above denial of the right to export groundwater does not constitute an undue burden on interstate commerce, inasmuch as no similar denial is made herein regarding surface waters awarded to the Tribes. In this regard, the Sporhase precedent is undisturbed.

G. FISHERIES, WILDLIFE AND AESTHETICS

1. Wildlife and Aesthetics

1. Hunting is mentioned in the Ft. Bridger Treaty of 1868, and is one of the purposes for which the Reservation was created.

2. The United States advanced that the entire flow of fifty-one (51) streams was necessary for aesthetic and wildlife purposes. Most of these streams occur in two areas designated as the Aesthetic Belts.

3. Evidence of intent to pursue industrial or mineral development within the Aesthetic Belt areas is uncontroverted, as is the fact that a stream that carries a flow of sixty percent (60%) of maximum historic flow will serve the same purposes for aesthetic and wildlife habitat as will one at one hundred percent (100%) of maximum historic flow.

4. The 60% factor will thus be used on all claims for instream flows in the two Aesthetic Belts of the Wind River Indian Reservation.

2. Fisheries

1. An implied reserved right for fisheries has been recognized by courts in at least three cases: Menominee Tribe v. United States, 383 F.2d 998 (1967), Coleville Confederated Tribes v. Walton, 460 F.Supp. 1320 (1978), and United States v. Anderson, No. 3643 (E.D. Wash), July 23, 1979.

2. The testimony of Robert N. Harris, Sr., Chairman of the Shoshone Business Council, underscores the history and present importance of fishing to the Shoshones. Fishing on the Reservation, once done solely for subsistence, has in latter years become a profit making proposition for the Tribes.

3. The impact of non-Indian fishing on the Reservation is greater on the main stem of the Wind River than on various Popo Agie or Little Wind streams or tributaries.

4. An award of fifty percent (50%) fisheries instream flow is adequate on the various forks and main stream of the Little Wind since they virtually headwater in Aesthetic Belt number 2, which has a 60% flow protection.

5. The testimony of witness Vogel supports the claim of the United States for an instream flow for fisheries, however, the incremental methodology used by him is still not so solid as to support an award of flows in the amounts he recommends.

6. Fifty percent (50%) of mean monthly flows in Stream Reaches 1 through 9 and Stream Reaches 15 and 16 is a reasonable and adequate award. However, this award shall not apply to Stream Reach 6 if said flow will impair contractual obligations with the Bureau of Reclamation regarding releases at Boysen Dam for downstream water and irrigation requirements.

7. An award for Stream Reaches 10, 11 and 12 of sixty percent (60%) of mean monthly flows is reasonable and adequate.

8. An award of forty percent (40%) of the claimed flows is made on Stream Reaches 13 and 14, and is reasonable and adequate.

3. Exclusive Storage Claim

1. The United States and Tribes assert that if full instream flows herein, plus historic and future irrigation requirements, cannot be satisfied, they be granted the right to construct exclusive storage facilities so that all their competing claims alone can be fulfilled.

2. To allow upstream storage and impoundment for exclusive Indian needs, without regard or consideration for the thousands of other citizens of Water Division 3 who also can benefit from managed storage, and who also have a right to the use of water, would be a disordered and unconscionable act.

3. The claim of the Tribes to construct exclusive storage facilities to satisfy competing claims is denied.

H. ESTOPPEL

1. Many state water rights may well be diminished to some degree in value by an award herein. Their owners feel strongly that the Federal government should be estopped from asserting a reserved right, particularly for futures projects on the Reservation, or in the alternative should compensate them for damages. Many, particularly families of those induced to pioneer the land, feel that at least the rights for future projects should be held in abeyance until upstream storage is in place to assure no adverse affects on state water rights.

2. Wyoming and private parties urge that simple notions of fair dealing estop the United States from asserting reserved water rights inconsistent with water rights acquired under Wyoming law.

3. Though damage may result in some degree to holders of state water rights, the application of estoppel as requested would merely be the imposition of a second wrong to atone for the first. Application of the doctrine is not warranted.

4. In this case, Wyoming brought the suit, and in effect the prayer of her Complaint is to have the Federal claims quantified. Neither equitable apportionment nor estoppel are remedies open to Wyoming.

I. EFFECT ON STATE WATER RIGHTS

1. Many settlers who applied for and received early permits labored for years to perfect their ditch work and diversions into adjudicated certificates to assure a source of water.

2. Congress intended and impliedly approved the "first in time, first in right" system adopted in the Territory of Wyoming, ratified by statehood, and long the policy of Wyoming. Today owners of water rights in Division 3 may suffer damages from an inability to put their rights to full use following the emplacement of an 1868 priority date for Indians in the upper reaches of the Wind River.

3. The Homestead Act of 1862, expanded in 1916 to include grazing lands, set out conditions for settlement of unappropriated public lands in the Rocky Mountain West. As a result of this legislation, between 1890 and 1920 over 132,898 acres in Water Division 3 were settled by non-Indians.

4. By the Desert Lands Act of 1873, Congress recognized that water was necessary for the successful settlement of arid western lands, thus assenting to the doctrine of prior appropriation. As a result of this Act, between 1916 and 1925 approximately 23,590 acres in Water Division 3 were settled by non-Indians.

5. Congress, in the Carey Act of 1894, again recognized the prior appropriation doctrine, the importance of water, and the necessity of irrigation for the successful development of arid lands. That Act outlined a disposal policy which resulted in the additional settlement by non-Indians of approximately 75,111 acres in Water Division 3.

6. The Reclamation Act of 1902 further recognized the necessity of water for settlement in the West. It stated that any project authorized under the Act was to proceed in recognition of state water rights laws. In Water Division 3, over 23,000 acres were deeded to non-Indians under this Act.

7. Approximately 255,000 acres in Water Division 3 were settled by non-Indians as a result of the Homestead Act of 1862, expanded in 1916, the Desert Lands Act of 1873, the Carey Act of 1894, and the Reclamation Act of 1902.

8. Under the doctrine of prior appropriation, imposition of an 1868 priority date for reserved water may have an adverse effect upon valid permits and certificates. To what degree each is harmed depends first upon its location, next its priority, and then quantity and scope of the newly recognized rights.

9. Some 9,000 defendants are on record as holders of approximately 25,000 adjudicated certificates, as evidenced in Master's Exhibit No. 1.

10. The State employed Mr. Gordon W. Fassett, an associate of Leonard Rice Consulting Engineers, and a registered engineer in at least three western states. Though Mr. Fassett and his assistants were professional and expert in their work, his model of water rights and effects thereon is not a basis for any finding of fact or conclusion of law. The assumptions that all Federal and Indian claims would be awarded and simultaneously exercised put a strong measure of qualification on the results.

11. Mr. Fassett arrived at a figure of about 800,000 acre-feet as the annual diversion requirement for Indian claims. Such a figure is much higher than if every optimized Indian and Federal claim were to be granted.

12. The Fassett model served its purpose, to buttress the proposition that state water rights would be adversely affected by the imposition of an 1868 reserved water right date on all Indian claims.

IN THE DISTRICT COURT OF THE

FIFTH JUDICIAL DISTRICT

STATE OF WYOMING

IN RE: THE GENERAL ADJUDICATION OF ALL RIGHT TO USE WATER IN THE BIG HORN RIVER SYSTEM AND ALL OTHER SOURCES, STATE OF WYOMING	)	Civil No. 4993

RECOMMENDED

FINAL DECREE OF WATER RIGHTS

FOR THE WIND RIVER INDIAN RESERVATION

ARTICLE I

Definitions

For the purpose of this decree:

A. "Diversion Requirement" means the amount of water necessary to be diverted from naturally occurring streams to supply beneficial uses.

B. "Indian water rights" means water rights reserved by the Treaty of Fort Bridger of July 3, 1868 with a priority date thereof, and held in trust by the United States for the benefit of the Shoshone and Arapahoe Indian Tribes of the Wind River Indian Reservation and other Indians on the Reservation holding land in fee, as described, quantified, or limited and set forth in the Articles of this decree.

C. "Livestock water requirements" means the diversion requirement necessary to satisfy the needs of livestock on the Wind River Indian Reservation.

D. "Municipal water requirements" means the diversion requirement, in addition to groundwater sources, to satisfy the personal water needs for the Indian population of Fort Washakie, Riverton, Ethete, Boulder Flat, Arapahoe, Pavillion, and remaining rural areas of the Wind River Indian Reservation for domestic, commercial and light industrial use.

E. "Stream Reach" means that section of a river or stream designated in United States Exhibit WRIRC-281, which is hereby incorporated by reference and made a part of this decree, and described herein, which depicts the section of river or stream through which fishery flows are required.

F. The boundaries of the Wind River Indian Reservation have been stipulated to by the parties. That stipulation is attached hereto as Appendix 1.

ARTICLE II

IT IS ORDERED, ADJUDICATED AND DECREED that the United States has reserved, in trust for the benefit of the Shoshone and Arapahoe Tribes of the Wind River Indian Reservation, the right to divert water or have water diverted in amounts set forth herein and from streams set forth herein, and further that said right has a priority date of July 3, 1868. The State Engineer shall have the right to monitor all said diversions.

The United States and the Shoshone and Arapahoe Tribes shall have the right to prevent the diversion of water from said streams if said diversion would interfere or prevent the United States or the aforesaid Tribes from utilizing the water rights herein established, granted and recognized.

SECTION 1

Agricultural Water Decreed

DESCRIPTION/SOURCE	AWARDED MEASURE IN ACRES	AWARDED ANNUAL DIVERSION IN ACRE-FEET
PROJECT LANDS - HISTORIC (does not include Indian fee owned land)		
WIND RIVER FEDERAL IRRIGATION PROJECT		
Little Wind Unit:		
Ray Canal	8,728	40,573
Coolidge Canal	6,425	27,880
Sub Agency Canal	2,958	13,730
Subtotal	18,111	82,183
Upper Wind Unit:		
(unspecified)	492	2,056
Wind River "A" Canal	944	9,959
Dinwoody Canal	4,716	49,754
Subtotal	6,152	61,769
Johnstown Unit:	667	3,837
Lefthand Unit:	1,205	7,267
MIDVALE IRRIGATION DISTRICT:	561	2,738
RIVERTON-LECLAIR IRRIGATION DISTRICT:	1,066	5,117
PROJECT LANDS SUBTOTAL	27,762	162,911

DESCRIPTION/SOURCE	AWARDED MEASURE IN ACRES	AWARDED ANNUAL DIVERSION IN ACRE-FEET
NON-PROJECT LANDS - HISTORIC (including all Indian owned fee lands awarded)		
WIND RIVER BASIN		
East Fork Wind River	32	141
Dinwoody Creek	134	649
Sand Draw	-0-	-0-
Dry Creek	1,273	5,584
Bull Lake Creek	63	296
Meadow Creek	680	3,125
Dry Pasup Creek	1,550	7,179
Crow Creek	2,505	11,646
Willow Creek	194	876
Main Stem Wind River	4,442	20,842
Subtotal	10,873	50,338
LITTLE WIND RIVER BASIN		
North Fork Little Wind River	1,712	7,961
South Fork Little Wind River	1,113	5,085
Main Stem Little Wind River	1,620	8,177
Mill Creek	28	136
Sage Creek	1,797	8,686
Crooked Creek	69	317
Trout Creek	228	1,088
Spring Creek	178	773
Bighorn Draw	139	600
Subtotal	6,884	32,823
BIGHORN RIVER BASIN		
Main Stem Bighorn River	54	280
Cottonwood Creek	689	3,548
Fivemile Creek	423	2,055
Muddy Creek	3,293	15,819
Dry Muddy Creek	-0-	-0-
Maverick Springs Draw	-0-	-0-
Roundup or Warm Springs	35	153
Subtotal	4,494	21,855

POPO AGIE RIVER BASIN		
North Fork Popo Agie River	472	2,231
Main Stem Popo Agie River	71	347
Subtotal	543	2,578
OWL CREEK BASIN		
South Fork Owl Creek	998	4,455
Main Stem Owl Creek	2,069	9,775
Mud Creek	766	3,620
Red Creek	-0-	-0-
Subtotal	3,833	17,850
NON-PROJECT LANDS SUBTOTAL	26,627	125,444
PROJECT LANDS SUBTOTAL	27,762	162,911
*TOTAL HISTORIC PROJECT AND NON-PROJECT LANDS	54,389	288,355

*Including Indian owned fee lands, totaling 6,155 acres and an awarded diversion of 28,095 acre-feet per year.

FUTURE PROJECTS	AWARDED MEASURE IN ACRES	AWARDED ANNUAL DIVERSION IN ACRE-FEET
North Crowheart	34,993	133,324
South Crowheart	4,238	18,181
Arapahoe	3,437	15,088
Riverton East	3,442	15,837
Big Horn Flats	2,410	6,507
TOTAL FUTURE PROJECTS	48,520	188,937

SECTION 2

Livestock Water

The United States and the Tribes are hereby awarded the use of groundwater which is fed by the Wind River, the Little Wind River, the Popo Agie River, into the Wind River aquifer and other shallow terraces and river level formations for livestock water requirements. Provided, however, that locations and flows of said wells be maintained in accurate records and said records be available to the State Engineer in order that monitoring may take place of the said livestock water requirements.

In addition hereto, the Tribes may divert up to 750 acre-feet annually from both the Wind River and Bighorn River or their tributaries, and from the Little Wind River or its tributaries; 60 acre-feet annually from the Popo Agie River or its tributaries; and 800 acre-feet annually from Owl and Red Canyon Creeks or their tributaries, for livestock water requirements. These surface diversions may be increased, but in no event shall they exceed twenty percent (20%) additional thereto prior to the year 2020.

SECTION 3

Municipal Water

The United States and the Tribes are awarded the following amounts for municipal, domestic and light commercial purposes:

AREA	SOURCE	ACRE-FEET PER YEAR 1980	2000	2020
Riverton	Big Wind River	18	32.4	46.8
	Groundwater	18	32.4	46.8
Fort Washakie	Little Wind River	455	799.2	1,166.4
Ethete	Little Wind River	257	450.0	658.8
Boulder Flat	Popo Agie River	26	44.4	67.2
Arapahoe	Groundwater	155	273.6	397.2
Pavillon	Groundwater	2	3.6	4.8
Other Rural	Groundwater	110	193.2	283.2
	TOTAL	1,041	1,828.8	2,671.2

Industrial and Mineral Development

MINERAL/ACTIVITY	MAXIMUM ANNUAL WATER USE in Acre-Feet
Oil Enhanced Recovery	6,580
Gas Refining	6
Sulfuric Acid Production	95
Anhydrous Ammonia Production	4,250
Coal Surface and Underground Mining	25
In Situ (Gasification and Syngas Production	2,800
Electricity Generating Station	2,490
Uranium Underground Mining	15
Yellowcake Processing	475
Phosphate Underground Mining	5
Beneficiation and Calcining Plant	425
Phosphoric Acid Production	400
Gypsum Surface Mining	10
Wallboard Production	300
TOTAL	17,876

Of the above, 9,370 acre-feet can be served from either surface or groundwater; provided, however, that all of the aforesaid future industrial groundwater award shall be from the deep aquifers. All shallow aquifers shall not be used as a water source for present or future industrial development. The lower or deeper water bearing formations, i.e. the Madison, the Big Horn, the Dolomite and the Frontier, are to be the sources for water for future industrial activities.

The exporting of groundwater outside the stipulated boundaries of the Wind River Indian Reservation for whatever purpose is hereby denied.

ARTICLE III

Fisheries, Wildlife and Aesthetics

IT IS FURTHER ORDERED, ADJUDICATED AND DECREED that the United States has reserved by virtue of the Treaty of July 3, 1868, and for the benefit of the Shoshone and Arapahoe Tribes, the right to prevent any person from diverting or attempting to divert from the minimum in stream flows of any of the waters in the following streams as set out in Section 1 and Section 2 of this Article. Provided further that said rights to prevent diversions or attempts to divert may be exercised by the United States or by the Shoshone or Arapahoe Tribes.

SECTION 1

Aesthetics and Wildlife Flows

There is hereby awarded a minimum stream flow of sixty percent (60%) of maximum historical flows on all streams and creeks within the boundaries of the two Aesthetic Belts on the Wind River Indian Reservation. Said Belts are depicted on United States Exhibit WRIR-7, which is hereby incorporated by reference and made a part of this decree. This requirement is non-consumptive in nature.

The right to the maintenance of sixty percent (60%) of maximum historic levels for the level of all natural lakes in the aforesaid two Aesthetic Belts is also awarded herein.

SECTION 2

Fishery Flows

There is hereby awarded the following mean monthly flows through the designated Stream Reaches of the Wind River Indian Reservation as defined in Exhibit WRIRC-281. Provided, however, that the awards on Stream Reach 6 shall be subject to prior contracts of the Bureau of Reclamation regarding releases from Boysen Dam to satisfy downstream irrigation and other water requirements.

FISHERY FLOWS

Mean Monthly Flows (cfs)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Stream Reach 1 - Wind River (above Dinwoody Creek)	87	86	88	129	160	160	160	160	160	160	123	100
Stream Reach 2 - Wind River (between Dinwoody and Bull Lake Creeks)	102	100	104	142	250	250	250	250	250	222	151	120
Stream Reach 3 - Wind River (between Bull Lake Creek and Diversion Dam)	127	125	129	186	250	250	250	250	250	250	183	146
Stream Reach 4 - Wind River (between Diversion Dam and Little Wind River confluence)	128	125	130	163	163	163	163	163	163	163	163	147
Stream Reach 5 - Wind River (below Little Wind River to boundary of Boysen Reservoir Withdrawal Area)	197	192	198	250	250	250	250	250	250	250	250	220
Stream Reach 6 - Wind River (Wind River Canyon)	200	195	222	250	250	250	250	250	250	250	250	222
Stream Reach 7 - East Fork Wind River (below Wiggins Fork)	23	22	23	48	104	104	104	104	62	41	28	25

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Stream Reach 8 - Bull Lake Creek (above Bull Lake)	15	16	15	24	108	108	108	108	90	42	23	17
Stream Reach 9 - Bull Lake Creek (below Bull Lake)	15	17	16	25	128	128	128	128	89	38	21	16
Stream Reach 10 - North Fork Little Wind River (below North Fork Canyon)	11	11	11	16	48	48	48	48	41	21	13	11
Stream Reach 11 - South Fork Little Wind River (below Washakie Reservoir)	13	15	13	19	66	66	66	55	43	24	17	13
Stream Reach 12 - Little Wind River (above Popo Agie River confluence)	30	30	30	42	45	45	45	45	45	45	36	31
Stream Reach 13 - North Fork Popo Agie River (below North Fork Canyon)	7	7	6	10	31	31	31	31	20	12	9	8
Stream Reach 14 - Popo Agie River (below the North and Middle Forks and above Little Wind River confluence)	19	18	18	38	69	69	69	69	56	36	24	20
Stream Reach 15 - Dinwoody Creek (below Dinwoody Lakes)	8	7	7	11	55	55	55	55	48	19	11	8
Stream Reach 16 - Crow Creek (above Crow Creek Canyon)	2	2	2	3	6	6	6	6	4	3	2	2

ARTICLE IV

Additional Agricultural Uses for Trust Lands Outside The Stipulated Boundaries of the Wind River Indian Reservation

IT IS ORDERED, ADJUDICATED AND DECREED that the United States, as trustee for the Shoshone and Arapaho Tribes, has no reserved water right for the lands described in Section 1 and Section 2 of this Article for the reason that said lands are outside the stipulated boundaries of the Wind River Indian Reservation.

Provided, however, that the above denial in no way affects the United States' right to the use of water on the lands described in the aforesaid Sections 1 and 2 pursuant to any valid certificates or uncancelled permits issued by the State of Wyoming upon which the United States or the Tribes elect to rely.

It is further ordered that the United States or the Tribes may divert under state law the amounts authorized by state law and with the priority dates set out in the column headed "State Awarded Priority Date".

SECTION 1

ARAPAHOE RANCH

MERRILL LAND PURCHASE

LANDS NORTH OF SOUTH FORK OF OWL CREEK

WATER SOURCE: South Fork of Owl Creek

DITCH NAME	PERMIT NO.	PROOF NO.	ACRES	STATE AWARDED PRIORITY DATE	AVERAGE ANNUAL DIVERSION (acre-feet)
Typer #4	11707	14032	64	5/16/12	350
Riggs	6621	14024	27	6/20/04	147
Typer #3	10719	n/a	9.4	none	-0-
TOTAL AVERAGE ANNUAL DIVERSION					497

The valid state certificates and permits above have been provisionally confirmed as was done in this proceeding with all other certificates and permits in Water Division 3, except those specifically recommended to the State Engineer for cancellation.

SECTION 2

PADLOCK RANCH PURCHASE

LANDS NORTH OF MAINSTEM OF OWL CREEK

WATER SOURCE: Owl Creek

DITCH NAME	PERMIT NO.	PROOF NO.	ACRES	STATE AWARDED PRIORITY DATE	AVERAGE ANNUAL DIVERSION (acre-feet)
Sliney & Mikkleson	Terr.	3526	122.63	10/1884	662
Sliney & Mikkleson	Terr.	3526	32.0	10/1884	173
Sliney & Mikkleson	Terr.	3527	222.63	10/1884	1202
Padlock	Terr.	3534	224.35	6/1887	1212
Dewit	2306	6271	17.0	10/4/1899	92
Sliney No. 1	4038	8350	160.0	7/11/02	864
Sliney No. 1	4038	8351	160.0	7/11/02	864
Rothwell Enl. of Sliney No. 1	2125E	15024	85.0	9/17/09	459
Rothwell Enl. of Sliney No. 1	2125E	15024	233.0	9/17/09	1258
Padlock	Terr.	3533	252.0	6/1887	1361
Padlock	Terr.	3534	41.0	6/1887	221
Padlock	Terr.	3534	285.44	6/1887	1541
Padlock	none	none	24.0	none	-0-
Sliney No. 1	none	none	12.0	none	-0-
Padlock	none	none	5.9	none	-0-
Padlock	none	none	43.1	none	-0-
Sliney No. 1	none	none	44.0	none	-0-
TOTAL AVERAGE ANNUAL DIVERSION					9,909

The valid state certificates and permits above have been provisionally confirmed as was done in this proceeding with all other certificates and permits in Water Division 3, except those specifically recommended to the State Engineer for cancellation.

ARTICLE V

All water rights listed herein may be exercised only for beneficial uses.

ARTICLE VI

All foregoing references to quantities of water necessary to supply annual diversion requirements for irrigation, and for municipal and industrial, mineral and livestock uses, shall constitute means of quantifying Indian water rights, but shall not constitute a restriction to uses indicated herein. If any Indian water rights decreed herein are used other than for purposes indicated herein, the total diversion shall not exceed the diversion requirements as set forth above; provided, however, that non-agricultural consumptive uses of waters, whether used on or off the Reservation, shall in no event be more than twenty-five percent (25%) of the annual diversion requirements awarded herein. And if said non-agricultural consumptive use is for purposes that involve the exporting of water from the Reservation, then said use is limited to ten percent (10%) of the twenty-five percent (25%) annual diversion in each decade following the date of this Report, unless upstream storage is in place to provide additional incremental storage for all water users effected. Nothing herein shall prohibit the leasing or bargaining of Tribal surface waters to upstream or downstream users, or other entities.

Provided further, that should the decision of the Tribes be to proceed with future irrigation projects in lieu of other uses, then and in that event not more than ten percent (10%) of the total acreage of the said future projects can be put into effect in any give decade unless upstream storage facilities shall have already been constructed to provide water for the additional acreage of said future projects.

ARTICLE VII

SECTION 1

In the event that additional land within the stipulated boundaries of the Reservation, (Stipulation attached hereto as Appendix 1), not held in trust as of the date of this Report shall be acquired in trust by the United States for the benefit of the Shoshone and Arapahoe Tribes, then such acquired land shall be entitled to no reserved water right. The date for the purpose of determining priority of water rights for said lands is the date of issuance of the state awarded water permit on said reacquired land if uncancelled at the time of reacquisition. If cancelled, or no state rights are in effect at the time of reacquisition, there are no reserved water rights for said reacquired lands.

SECTION 2

For Indian owned fee land within the stipulated boundaries of the Reservation awarded a reserved water right herein and reacquired by the Tribes after the date of this Report, the reserved right shall continue in full force and effect.

This is a conclusive adjudication and a final decree in its broadest and most permanent sense. The grant herein of the Tribal reserved right is based upon the amount necessary to irrigate all of the practicably irrigable acres on the Reservation. This is a definite and certain determination, designed to meet the future as well as present potential, and needs of the Tribes.

A provision herein at the foot of the decree for its amendment or further relief would be in defeat of the very purpose of a general mainstream adjudication. Nor is it necessary to correct genuine mistake of fact or a mathematical miscalculation, or other merely clerical error, some of which may well abound in a case of this size. A court normally possesses the inherent power to correct its decrees in such matters.[1] All quantifications of the reserved right for waters necessary to fulfill the purposes of the Wind River Indian Reservation shall be the maximum and final claim for such reserved right in Water Division 3.

1. See Briggs v. Pennsylvania R.R., 334 U.S. 304, 306 (1968); Perkins v. Standard Oil Co., 487 F.2d 672, 674 (9th Cir. 1973).

The Honorable Harold Joffe, Judge
District Court of the Fifth Judicial District
Worland, Wyoming

Sir:

This Report, together with the Findings of Fact and Conclusions of Law therein contained, and the recommended decree thereto annexed are

Respectfully submitted,

Teno Roncalio
Special Master

Cheyenne, Wyoming
December 15, 1982

Teno Roncalio

This Report deals only with Indian Claims. Federal claims for usage on the other Federal entities of Water Division 3, determination of the status of uncancelled permits, and determination of the extent and priority of adjudicated rights will be addressed in a Supplementary Report.

I acknowledge with gratitude and appreciation the labors of:

Vicki Lynn Hoffsetz, whose extraordinary ability in word processing was of immense help;

Billie Ruth Edwards, whose competence in legal research was of utmost help, particularly in the compilations of Part II; and

Leo J. Salazar, my most valuable and able assistant throughout the long trial and in all phases of research and writing in the preparation of this Report.

APPENDICES

APPENDIX 1

IN THE DISTRICT COURT OF THE

FIFTH JUDICIAL DISTRICT

STATE OF WYOMING)
) ss:
COUNTY OF WASHAKIE)

IN RE:

THE GENERAL ADJUDICATION OF)
ALL RIGHTS TO USE WATER IN)
THE BIG HORN RIVER SYSTEM) Civil No. 4993
AND ALL OTHER SOURCES,)
STATE OF WYOMING)

STIPULATION CONCERNING THE BOUNDARIES OF
THE WIND RIVER INDIAN RESERVATION

The United States of America, State of Wyoming and Shoshone and Arapahoe Indian Tribes move the Special Master to enter an order approving the following stipulation for the purposes of this litigation only:

For the purposes of determining the reserved or other rights to the use of water, if any, which may exist with respect to the Wind River Indian Reservation, the exterior boundaries of the Wind River Indian Reservation are as set forth in the United States Statement of Geographic Boundaries filed herein, and are agreed to include the following-described lands:

That part of the Wind River Meridian more particularly described as follows:

Sections 1 through 36 in the following Townships and Ranges:

T. 1N R. 1E
T. 1N R. 2E
T. 1N R. 3E
T. 1N R. 4E
T. 1N R. 5E
T. 2N R. 1E
T. 2N R. 2E
T. 2N R. 3E
T. 2N R. 4E

1	1	56
1	2	31
1	3	28
1	4	32
1	5	45
1	6	35
1	7	15
1	8	25
1	9	30
1	10	42
1	11	36
1	12	45
1	13	26
1	14	15
1	15	22
1	16	35
1	17	45
1	18	31
1	19	25
1	20	32
1	21	48
1	22	55
1	23	31
1	24	22
1	25	34
1	26	45
1	27	15
1	28	21
1	29	32
1	30	45
1	31	25
1	32	41
1	33	24
1	34	41
1	35	24
1	36	49
1	37	25
1	38	42
1	39	42
1	40	49
1	41	25
1	42	34
1	43	44
1	44	25
1	45	42
1	46	41
1	47	49
1	48	24
1	49	42
1	50	41
1	51	49
1	52	24
1	53	42
1	54	41
1	55	49
1	56	24
1	57	42
1	58	41
1	59	49
1	60	24
1	61	42
1	62	41
1	63	49
1	64	24
1	65	42
1	66	41
1	67	49
1	68	24
1	69	42
1	70	41
1	71	49
1	72	24
1	73	42
1	74	41
1	75	49
1	76	24
1	77	42
1	78	41
1	79	49
1	80	24
1	81	42
1	82	41
1	83	49
1	84	24
1	85	42
1	86	41
1	87	49
1	88	24
1	89	42
1	90	41
1	91	49
1	92	24
1	93	42
1	94	41
1	95	49
1	96	24
1	97	42
1	98	41
1	99	49
1	100	24

ok - JLM

SHOULD READ:

-3-

SOUTH FORK SECTIONS 1-3, 10-15, 19, 21-28, 34-36 AND E½ SECTIONS 5 AND 8 W½ SECTIONS 6, 7 AND 18 NE¼ SECTION 23 W½ SE¼ SECTION 25 NE¼ NW¼ SECTION 33 AND LOTS 1-6 SECTION 33 AND UNSURVEYED SECTIONS 4, 9, 16, 17 AND 20 AND FRACTIONAL SECTIONS 29, 30, 31 AND 32 AND W½ SECTIONS 5 AND 8 AND E½ SECTIONS 6, 7 AND 18.

T. 6N R. 3W
T. 6N R. 4W
T. 6N R. 5W
T. 7N R. 1W
T. 7N R. 2W
T. 7N R. 3W
T. 7N R. 4W

And portions of the following Townships and Ranges:

T. 1S R. 3E

~~Sections 1 - 28, 34, 35, 36 and portions of Sections 29, 30, 32 and 33 (unsurveyed)~~

T. 8N R. 4W

SW¼ Section 1
S½ SE¼ Section 1
N½ SE¼ Section 1
S½ NW¼ Section 1
Lots 1 through 4 Section 1

And, all of Sections 2 through 36.

T. 2S R. 2E

Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 16, 17, 18

And,

NW¼ Section 11
W½ NE¼ Section 11
Lot 4
W½ SW¼ Section 11
NE¼ SW¼ Section 11
Lots 1, 2 and 3 Section 11
Lots 1 - 5 Section 12
Lots 1 - 5 Section 14
N½ Section 15
N½ S½ Section 15
S½ SW¼ Section 15
Lots 1 and 2 Section 15
SE¼ Section 19
E½ NW¼ Section 19
E½ SW¼ Section 19
Lots 1 - 8 Section 19
N½ Section 20
Lots 1 - 5 Section 20
NW¼ Section 21
NE¼ NE¼ Section 21
W½ NE¼ Section 21
Lots 1 - 5 Section 21
NW¼ NW¼ Section 22
Lots 1 - 4 Section 22
Lots 1 - 5 Section 30

T. 28 R. 1E

Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 24

And,

E½ Section 14
Lots 1 - 8 Section 15
Lots 1 - 6 Section 16
N½ NE¼ Section 16
N½ NW¼ Section 16
N½ Section 17
N½ SE¼ Section 17
NE¼ SW¼ Section 17
Lots 1 - 4 Section 17
N½ N½ Section 18
Lots 2 - 5 Section 19
Lot 1 Section 20
E½ NW¼ and NW¼ NW¼ Section 14
Lots 1 - 3 Section 14
NE¼ NE¼ Section 23
Lots 1 - 4 Section 23
E½ NW¼ Section 25
W½ NE¼ Section 25
Lots 1 - 7 Section 25
Lots 1 - 2 Section 26
NW¼ NW¼ Section 25

T. 28 R. 3E

Sections 1, 2, 3, 4, 5, 6

And,

Lots 1 - 5 Section 7
Lots 1 - 4 Section 8
Lots 1 - 4 Section 9
Lots 1 - 4 Section 10
Lots 1 - 4 Section 11
Lots 1 - 4 Section 12

T. 28 R. 4E

Sections 1 - 6

Lots 1 - 4 Sections 7 through 12

T. 28 R. 5E

Sections 1 - 6

Lots 1 - 4 Sections 7 through 12

T. 18 R. 6E

Sections 4 - 9, 16 - 21, 28 - 33,

And,

W½ SW¼ Section 3
SW¼ NW¼ Section 3
Lots 1 - 5 Section 3
W½ W½ Sections 10, 15, 22, 27, 34
Lots 1 - 4 Sections 10, 15, 22, 27, 34

T. 2S R. 6E

Sections 4, 5, 6

And,

W½ W½ Section 3
Lots 1 - 4 Section 3
Lots 1 - 4 Sections 7, 8, 9
Lots 1 - 2 Section 10

T. 2S R. 5W

Sections 1, 2, 11, 12, 13

And,

NW¼ Section 3
SE¼ Section 3
W½ NE¼ Section 3
E½ SW¼ Section 3
Lots 1 - 4 Section 3
NE¼ NE¼ Section 4
Lots 1 and 2 Section 4
NE¼ Section 10
N½ SE¼ Section 10
SE¼ SE¼ Section 10
NE¼ NW¼ Section 10
Lots 1 - 5 Section 10
E½ NE¼ Section 15
NE¼ SE¼ Section 15
Lots 1 - 4 Section 15
E½ Section 14
E½ W½ Section 14
W½ NW¼ Section 14
NW¼ SW¼ Section 14
Lot 1 Section 14
NE¼ Section 23
E½ NW¼ Section 23
NE¼ SW¼ Section 23
N½ SE¼ Section 23
Lots 1 - 7 Section 23
N½ Section 24
N½ S½ Section 24
Lots 1 - 4 Section 24

T. 2S R. 3W

Sections 1 - 18

And,

NE¼ Section 19
E½ NW¼ Section 19
NE¼ SW¼ Section 19
N½ SE¼ Section 19
Lots 1 - 7 Section 19
N½ Sections 20 - 23
N½ S½ Sections 20 and 23
Lots 1 - 4 Sections 20 and 23
Lots 1 - 8 Sections 21 and 22
Lots 1 - 7 Section 24
NW¼ Section 24
W½ NE¼ Section 24
N½ SW¼ Section 24
NW¼ SE¼ Section 24
Lots 1 - 7 Section 24

T. 2S R. 4W

Section 1 - 18

NE¼ Section 19
N½ SE¼ Section 19
E½ NW¼ Section 19
NE¼ SW¼ Section 19
Lots 1 - 7 Section 19
N½ Sections 20 - 24
N½ S½ Sections 20 - 24
Lots 1 - 4 Sections 20 - 24

T. 2S R. 1W

Sections 1 - 12, 16, 17, 18

And,

N½ NE¼ Section 13
Lots 1 - 6 Section 13
N½ N½ Section 14
SW¼ NW¼ Section 14
Lots 1 - 4 Section 14
N½ Section 15
N½ SW¼ Section 15
SW¼ SW¼ Section 15
Lots 1 - 4 Section 15
NE¼ Section 19
N½ SE¼ Section 19
E½ NW¼ Section 19
NE¼ SW¼ Section 19
Lots 1 - 7 Section 19
N½ Section 20
N½ S½ Section 20
Lots 1 - 4 Section 20
N½ Section 21
NW¼ SW¼ Section 21
Lots 1 - 4 Section 21
NW¼ NW¼ Section 22
Lots 1, 2, 3 Section 22

T. 2S R. 2W

Sections 1 - 18

And,

NE¼ Section 19
N½ SE¼ Section 19
E½ NW¼ Section 19
NE¼ SW¼ Section 19
Lots 1 - 7 Section 19
N½ Sections 20 - 24
N½ S½ Sections 20 - 24
Lots 1 - 4 Sections 20 - 24

T. 7N R. 5W

Sections 1 - 4, 8 - 36

And,

S½ Section 5
S½ NE¼ Section 5
SE¼ NW¼ Section 5
Lots 1, 2, 3 and 4 Section 5

And, Lots 1, 2, 3 Section 6
SE¼ SE¼ Section 6
E½ Section 7
E½ SW¼ Section 7
SE¼ NW¼ Section 7

And, Lots 1 - 4 Section 7

T. 1S R. 6W Note: This Township was unsurveyed except that portion inside the Reservation which is shown on the exterior boundary plat.

(Unsurveyed) - Sections 1 - 3, 10 - 15, 23 - 25

T. 9N R. 5W

Lots 1 and 2 Sections 25 and 35
Lots 1 - 3 Section 36
SE¼ Section 36
E½ NE¼ Section 36
SW¼ NE¼ Section 36
E½ SW¼ Section 36
SW¼ SW¼ Section 36

T. 1N R. 6W (This Township is unsurveyed except for the western boundary of the Reservation and portion of the southern boundary and south 3 miles of the eastern boundary of the Township.)

(Unsurveyed) - Sections 1, 2, 3, 10 - 15, 22 - 27, 34 - 36

T. 2N R. 6W (The only portion of this Township that is surveyed is approximately the NE¼.)

(Unsurveyed) - Sections 1 - 3, 10 - 15, 22 - 27, 34 - 36

T. 3N R. 6W

Sections 1, 2, 11 - 14, 23 - 26, 35, 36

E½ Sections 3, 10, 15, 22, 27, 34
Lots 1 - 4 Sections 10, 15, 22, 27, 34
Lots 1 - 6 Section 3

T. 4N R. 6W

Sections 11 - 14, 23 - 26, 35, 36

E½ Sections 10, 15, 22, 27, 34
Lots 1 - 4 Sections 10, 15, 22, 27, 34
SE¼ Section 3
S½ NE¼ Section 3
Lots 1 - 6 Section 3

S½ Section 2
S½ N½ Section 2
Lots 1 - 4 Section 2
SW¼ Section 1
S½ NW¼ Section 1
W½ SE¼ Section 1
SW¼ NE¼ Section 1
Lots 1 - 7 Section 1

T. 5N R. 5W

Sections 1, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 33, 34, 35, 36

And,

S½ Section 2
S½ NE¼ Section 2
SE¼ NW¼ Section 2
Lots 1 - 4 Section 2
SE¼ SE¼ Section 3
Lots 1 and 2 Section 3
SE¼ SE¼ Section 9
Lots 1 and 2 Section 9
S½ Section 10
NE¼ Section 10
SE¼ NW¼ Section 10
Lots 1 and 2 Section 10
E½ Sections 16, 21, 28, 32
Lots 1 - 4 Sections 16 and 21
E½ SW¼ Section 16
SE¼ NW¼ Section 16
SW¼ Section 28
SE¼ NW¼ Section 28
Lots 1 and 2 Section 28 and 29
SE¼ SE¼ Section 29
Lots 1 - 4 Section 32

T. 5N R. 6W

Sections 1, 2, 11 - 14, 23 - 26, 35, 36

E½ E½ Sections 10, 15, 22, 27, 34
Lots 1 - 4 Sections 10, 15, 22, 27, 34
E½ SE¼ Section 3
Lots 1 - 9 Section 3

T. 6N R. 6W

Sections 1, 2, 11 - 14, 23 - 26, 35, 36, 15

And,

E½ Sections 10, 22, 27, 34
Lots 1 - 6 Section 3
SE¼ Section 3
S½ NE¼ Section 3
SE¼ SW¼ Section 10
Lots 1 - 4 Section 10
Lots 1 - 3 Section 16
NW¼ Section 22
E½ SW¼ Section 22
NW¼ SW¼ Section 22

Lot 1 Section 22
Lots 1, 2, 3 Section 21
SE¼ NW¼ Section 27
SE¼ SW¼ Section 27
Lots 1 - 4 Section 27
NE¼ NW¼ Section 34
NE¼ SW¼ Section 34
Lots 1 - 4 Section 34
Lot 1 Section 9

T. 7N R. 6W

Sections 13, 23 - 26, 35, 36

SE¼ Section 12
S½ SW¼ Section 12
Lots 1 - 4 Section 12
Lot 1 Section 11
SE¼ Section 14
NE¼ NE¼ Section 14
S½ NE¼ Section 14
NE¼ SW¼ Section 14
S½ SW¼ Section 14
Lots 1 - 4 Section 14
SE¼ SE¼ Section 22
Lots 1 - 4 Section 22
E½ E½ Sections 27, 34
Lots 1, 2 Section 15
Lots 1 - 4 Sections 27, 34
W½ SE¼ Section 34

T. 8N R. 1W

Sections 32 - 36, 23 - 28

S½ and NE¼ Section 22
S½ NW¼ Section 22
NE¼ NW¼ Section 22
Lot 1 Section 22
Lots 1 and 2 Section 13
Lots 1, 2, 3 Section 14
Lots 1, 2 Section 15
S½ SE¼ Section 21
NE¼ SE¼ Section 21
SE¼ SW¼ Section 21
Lots 1 - 5 Section 21
Lot 1 Section 20
SE¼ Sections 29 and 31
E½ SW¼ Sections 29 and 31
NE¼ NE¼ Sections 29 and 31
S½ NE¼ Sections 29 and 31
SW¼ SW¼ Section 29
Lots 1, 3 Section 29
Lots 1 - 4 Section 31
NW¼ NE¼ Section 31
SE¼ SE¼ Section 30
Lots 1, 2 Section 30

T. 8N R. 2W

Lots 1 and 2 Section 30
Lots 1 - 6 Section 31
SE¼ Section 31
S½ NE¼ Section 31
E½ W½ Section 31
S½ Section 32
S½ NW¼ Section 32
Lots 1 - 4 Sections 32, 33, 34, 35, 36
S½ S½ Sections 33 and 36
SW¼ SW¼ Section 34
S½ SE¼ Section 35

T. 8N R. 4E

Sections 14 - 23, 26 - 35, 7

Lots 1 and 2 Sections 12, 13, 24, 25, 36
S½ S½ Section 11
NW¼ SW¼ and SW¼ NW¼ Section 11
Lots 1 - 4 Sections 10, 11
S½ and SW¼ NW¼ Section 10
S½ and SE¼ NW¼ Section 9
Lots 1 - 4 Section 9
S½ and S½ NW¼ Section 8
Lots 1 - 4 Section 8
Lots 1 and 2 Section 5
Lots 1 - 4 Section 6

T. 7N R. 5E

Sections 19 - 36

Lots 1 - 4 Sections 13 - 18

T. 1N R. 6E

Sections 4 - 19, 16 - 21, 28 - 33

Lots 1 - 4 Sections 10, 15, 22, 27, 34
W½ W½ Sections 10, 15, 22, 27, 34
W½ SW¼ and SW¼ NW¼ Section 3
Lots 1 - 5 Section 3

T. 2N R. 6E

Sections 4 - 9, 16 - 21, 28 - 33

W½ W½ Sections 10, 15, 22, 27, 34
Lots 1 - 4 Sections 10, 15, 22, 27, 34
W½ SW¼ and SW¼ NW¼ Section 3
Lots 1 - 5 Section 3

T. 3N R. 6E

Sections 4 - 9, 16 - 21, 28 - 33

W½ W½ Sections 10, 15, 22, 27, 34
Lots 1 - 4 Sections 10, 15, 22, 27, 34
W½ SW¼ and SW¼ NW¼ Section 3
Lots 1 - 5 Section 3

T. 4N R. 6E

Sections 4 - 9, 16 - 21, 28 - 33

W½ W½ Sections 10, 15, 22, 27, 34
Lots 1 - 4 Sections 10, 15, 22, 27, 34
W½ SW¼ and SW¼ NW¼ Section 3
Lots 1 - 5 Section 3

T. 8N R. 3E

Sections 3 - 36

And, S½ SW¼ Section 1
Lots 1 - 6 Section 1
S½ Section 2
S½ NW¼ Section 2
Lots 1 - 4 Section 2

T. 9N R. 3E

Sections 31 and 32

S½ SW¼ Section 29
Lots 1 - 5 Section 29
Lots 1 - 4 Section 28
SW¼ SE¼ Section 29
S½ SE¼ Section 30
SE¼ SW¼ Section 30
Lots 1 - 5 Section 30
SW¼ and S½ NW¼ Section 33
W½ SE¼ Section 33
SW¼ NE¼ Section 33
Lots 1 - 5 Section 33
SE¼ SE¼ Section 33
SW¼ SW¼ Section 34
Lots 1 - 4 Section 34
Lot 1 Section 35

T. 8N R. 1E

Sections 12 - 14, 19 - 36

And, Lots 1 - 5 Section 2
S½ Section 11
E½ NE¼ and SW¼ NE¼ Section 11
SE¼ NW¼ Section 11
Lots 1 - 3 Section 11
E½ and SW¼ of the SE¼ Section 10
SE¼ SW¼ Section 10

Lots 1 - 4 Section 10
S½ S½ and N½ SE¼ Section 16
SE¼ NE¼ Section 16
Lots 1 - 4 Section 16
S½ SE¼ Section 17
Lots 1 - 4 Section 17
Section 18 unsurveyed portion
S½, S½ NE¼, SE¼ NW¼ Section 1
Lots 1 - 5 Section 1
E½, SW¼, S½ NW¼, NE¼ NW¼ Section 15
Lot 1 Section 15

T. 9N R. 1E

SE¼ SW¼ Section 36
S½ SE¼ Section 36
Lots 1 - 4 Section 36
Lot 1 Section 35

T. 9N R. 2E

Section 36

And,

SE¼ and E½ and SW¼ of the SW¼ Section 25
Lots 1 - 4 Section 25
NE¼ and SE¼ and SW¼ Section 35
SE¼ NW¼ Section 35
Lots 1 - 3 Section 35
Lots 1 and 2 Section 26
SE¼ and E½ SW¼ Section 34
SW¼ SW¼ Section 34
Lots 1 - 5 Section 34
S½ S½ Section 33
Lots 1 - 4 Section 33
S½ S½ Section 31 and 32
Lots 1 - 4 Section 32
Lots 1 - 5 Section 31
NW¼ SW¼ Section 31

T. 9N R. 4W

Sections 21, 27 - 29, 31 - 34

Lot 1 Sections 15 and 36
Lots 1 - 3 Section 16
SW¼ SW¼ Section 16
Lots 1 and 2 Sections 17 and 19
Lots 1 - 3 Section 20
SE¼ and the S½ and NE¼ of the NE¼ and the
E½ SW¼, and the SW¼ SW¼ Section 20
Lots 1 - 4 Section 22
SW¼ and the SW¼ SE¼ Section 22
W½ and SE¼ of the NW¼ Section 22
Lots 1 - 4 Section 26
SW¼ SW¼ Section 26
Lots 1 - 5 Section 30
LOT 1 SECTION 23

E½ and SW¼ of the NE¼ Section 30
E½ of the SW¼ ~~and W½ SE¼~~ Section 30
Lots 1 - 4 Section 35
SW¼ and the SW¼ SE¼ Section 35
W½ and SE¼ of the NW¼ Section 35
SE¼ Section 30

T. 8N R. 3W

Sections 16 - 22, 26 - 36

Lot 1 Sections 6 and 10
Lots 1 - 6 Section 7
SE¼ Section 7
S½ NE¼ Section 7
E½ SW¼ Section 7
E½ NW¼ Section 7
S½ Section 8
SE¼ NW¼ Section 8
Lots 1 - 4 Sections 8, 9
SW¼ Section 9
W½ SE¼ and SE¼ SE¼ Section 9
Lots 1 - 4 Section 15
SW¼ Section 15
SW¼ NW¼, W½ SE¼ Section 15
SE¼ SE¼ Section 15
Lots 1 and 2 Sections 14 and 24
Lots 1, 2, 3 Sections 23 and 25
SW¼ Section 23
W½ and SE¼ of the NW¼ and W½ and SE¼ of the SE¼ Section 23
SW¼ Section 25
W½ and SE¼ of the NW¼ and W½ and SE¼ of the SE¼ Section 25

T. 5N R. 6E

Sections 4 - 9, 16 - 21, 28 - 33

Lots 1 - 3 Section 3
Lots 1 - 4 Sections 10, 15, 22
Lots 1, 2, 5 and 6, Section 27
Lots 2, 3, 6 and 7, Section 34

T. 6N R. 6E

Unsurveyed Sections: 4, 5, N½ Section 8 and NW¼ Section 9

Sections 6, 7, 16 - 21, 28 - 33

S½ Sections 8 and 9
Lots 1 - 4 Sections 3, 10, 22, 27, 34
Lots 1 - 7 Section 15
NE¼ Section 9

T. 7N R. 6E

Sections 19 - 21, 28 - 33

Lots 1 - 4 Sections 16, 17, 18, 22, 27, 34
Lot 1 Section 15

T. 7N R. 4E

Sections 2 - 11, 14 - 36
Lots 1 and 2 Sections 1 and 12
Lots 1 - 5 Section 13
SW¼ SW¼ Section 13

The parties reserve their rights to challenge the validity, priority date, purposes, quantity of water, and any other characteristic of any water rights which may be claimed in the above-described area.

This stipulation shall not affect the jurisdiction of any parties over lands within the exterior boundaries of the Reservation.

AGREED this 15th day of April, 1980.

For the United States:

Regina L. Sleater
U.S. Department of Justice
Land & Natural Resources Division
Washington, D.C. 20530

Tom W. Echohawk
U.S. Department of Justice
Land & Natural Resources Division
Washington, D.C. 20530

by RS

Charles E. Graves
U.S. Attorney
Cheyenne, Wyoming 82001

by RS

APPROVED AS TO LEGAL DESCRIPTION:

Richard L. Dikes
Chief, Branch of Cadastral Surveys
B.L.M., Cheyenne, Wy

For the Shoshone and Arapahoe Indian Tribes:

Harry R. Sachse
SONOSKY, CHAMBERS & SACHSE
2030 M Street, N.W.
Washington, D.C. 20036

R. Anthony Rogers
WILKINSON, CRAGUN & BARKER
1735 New York Avenue, N.W.
Washington, D.C. 20006

William R. Thomson
DRAY, MADISON & THOMSON
204 East 22nd Street
Cheyenne, Wyoming 82001

For the State of Wyoming:

Jack D. Palma, II
Senior Assistant
Attorney General
State of Wyoming
123 Capitol Building
Cheyenne, Wyoming 82002

James L. Merrill
Special Assistant
Attorney General
State of Wyoming
Yegge, Hall & Evans
2900 Energy Center One
717 Seventeenth Street
Denver, Colorado 80202

APPENDIX 2

GLOSSARY

AUM: Animal Unit Month. The grazing requirement for one animal unit (1,000# cow) for one month.

ADJUDICATED LANDS: Land upon which exists an uncancelled state awarded permit or adjudicated water right.

ARABLE LAND: Arable lands are those lands which are capable of sustained irrigation.

BIA: Bureau of Indian Affairs.

BENEFIT/COST RATIO: An expression of probable economic feasibility of a proposal.

cfs: Cubic feet per second.

DEEP PERCOLATION: The downward movement of water through saturated soil when the force of gravity exceeds the soil/water attraction.

DEPTH TO BARRIER: The depth of soil above a layer of soil or rock which has a hydraulic conductivity less than one-tenth of that of the soils lying above it.

DIVERSION REQUIREMENT: The amount of water diverted from the source in order to meet the net irrigation requirement.

DRAINAGE (INTERNAL): The removal of water from soil by natural or artificial means.

DRAINAGE DEFICIENCY: A characteristic of a soil which limits the ability to remove excess water under sustained irrigation.

EFFECTIVE ROOTING DEPTH: The depth of soil in which plant roots can effectively grow and receive essential elements necessary for growth. Water table, gravel beds, or bedrock are examples of mediums that might restrict effective rooting depth.

EVAPOTRANSPIRATION: The loss of water from the soil and plant foliage (evaporation) and by the passage of a watery vapor through the plant's membrane or pores (transpiration).

FIP: Federal Irrigation Project.

FLOOD PLAIN: The land bordering a stream, built up of sediments from overflow of the stream and subject to inundation when the stream is at flood stage.

GRAVITY IRRIGATION: A method of irrigation where water is supplied to one part of a field and is spread over the surface of the remaining portions of the field by the force of gravity.

HYDRAULIC CONDUCTIVITY: An expression of the speed with which water flows through a soil in response to a given potential gradient; permeability.

HYDROGRAPHY: The description and study of bodies of water, as in the measurement and charting of flow and investigation of the behavior of streams.

INDIAN FEE LAND: Land owned in fee by individual members of a tribe; not subject to trust control.

INFILTRATION: The downward rate of entry of water into the soil.

IRRIGABLE LANDS: Irrigable lands are those arable lands capable of sustained irrigation.

LAND CLASS: A category of lands having similar physical and economic characteristics which affect the suitability of land for sustained irrigation.

LAND CLASSIFICATION SPECIFICATIONS: A list of land deficiencies and ranges of severity of these deficiencies which are allowed in each land class.

LAND FORM: A portion of the landscape having similar distinctive land features and characteristics. It includes flood plains, terraces, benches, alluvial fans, colluvial slopes, aeolian deposits, glacial morains.

LOGGED HOLE: A comprehensive description of the layers of soil observed during completion of a soil boring.

NET IRRIGATION REQUIREMENT: The amount of water consumptively used in irrigation; the diversion requirement minus losses in conveyance, application and evapotranspiration.

NEUTRAL SOIL: A soil which is neither acid nor alkaline in reaction. Usually a soil having a pH between 6.6 and 7.3.

OPPORTUNITY COST: A value which seeks to reflect true value in terms of national perspective; the costs of a resource at its next best use.

PIA: Practicably Irrigable Acre. Those acres susceptible to sustained irrigation at reasonable costs.

PARENT MATERIAL: The unconsolidated mineral or organic matter from which the solus of a soil is developed.

PERMEABILITY: The rate with which gases or liquids penetrate or pass through a soil.

pH: The negative logarithm of the hydrogen ion activity of a soil. A relative measure of the acidity or alkalinity of a soil. A pH of 7 is considered neutral.

PRIMA FACIE: A fact presumed to be true unless disproved by some evidence to the contrary. A prima facie case is one which is established by sufficient evidence and can be overcome only by rebutting evidence.

RECONNAISSANCE CLASSIFICATION: This level of classification involves a general outline of land features of conspicuous importance in preliminary planning of irrigation development. It is used on large areas where only general information on the extent of arable land is required.

SCS: Soil Conservation Service.

SEMI-DETAILED CLASSIFICATION: Reflects a degree of work effort required to obtain an accuracy level for desired results from an investigation. This level of investigation requires careful examination of land features and considerable accuracy in the separation of arable land from nonarable lands.

SODIUM ABSORPTION RATIO (SAR): Term used to express the relative activity of sodium ions versus the activity of calcium-magnesium ions in soil or water. Indicator of sodicity.

SOIL DEFICIENCY: A characteristic of a soil which limits its usefulness for sustained irrigation.

STEREOSCOPIC ANALYSIS: Interpretation of aerial photographs with the use of a stereoscope. The stereoscope produces three dimensional effects from a two dimensional representation.

STUDY AREA: That portion of the land base which, after preliminary analysis of irrigation capability, water availability and other engineering factors, displays the greatest potential for receiving irrigation water together with the capability of supporting sustained irrigation.

SUSTAINED IRRIGATION: The ability of a soil to produce a relatively high yield of crops under irrigation over a long period of time without deterioration.

TERRACE: A level, usually narrow, plain bordering a river, lake or sea. Rivers sometimes are bordered by terraces at different levels.

TOPOGRAPHY DEFICIENCY: A characteristic of topography which limits its usefulness for sustained irrigation.

USBR: United States Bureau of Reclamation.

UNADJUDICATED IN-USE LANDS: Unpermitted lands whose use is unrecorded with the State Engineer's office.

WRC: Water Resources Council. An independent agency of the Federal Government.

WATER HOLDING CAPACITY: The amount of water a soil can hold against the pull of gravity, mainly a function of soil texture.

WATER TABLE: The upper surface of groundwater, or that level below which the soil is saturated with water.

APPENDIX 3

INDEX OF WITNESSES

Witness	Appearing for	Subject	Transcript Vol. No.	Date
Richard Harbour	United States	Soil Scientist	1-2	1/26/81
James Merchant	United States	Economist	1-6	1/26-28/81
Oliver Page	United States	Hydrology and Groundwater Development	7-9	1/29-30/81
A.T. Kersich	United States	Agricultural Engineer	10-17 36-37	2/9-13/81 4/14-15/81
Ronald Billstein	United States	Water Resource Planning	18-33 82-86	3/9-19/81 6/19/81
Craig Sommers	Wyoming	Soil Scientist & Agronomist	34-35 119-124 135-136	4/14/81 10/2-6/81 11/12/81
Ross Waples	United States	Land Classifier Soil Scientist	38-43	4/10-21/81
Robert Toedter	United States	Agricultural Engineer, irrigation & drainage	43-46 78-79 86-87	4/21-23/81 6/15/81 7/9-10/81
Woldezion Mesghinna	United States	Irrigation Engineer	46-54 63-64 135	4/24-5/7/81 5/14-15/81 11/12/81
David Dornbusch	United States	Economic Feasibility	54-57 65-70	5/8-11/81 5/19-21/81

Thomas Stetson	United States	Water Duty Engineer	58-63	5/12-14/81
David Vogel	United States	Fishery Management Biologist and software computer programming	71-77	6/2-5/81
Michael Keene	United States	Engineer, historic & natural flows	80-82	6/16/81
George Christopulos	Wyoming	State Engineer	88-89 106-108 163	7/16/81 9/21/81 12/17/81
Mae Eckman	Tribes	Title & Record Documents	89	7/16/81
Robert Harris	Tribes	Chairman, Shoshone Business Council	89	7/16/81
Pius Francis Moss	Tribes	Member, Arapahoe Tribe	89-90	7/16-17/81
Frank Enos	Tribes	Member, Shoshone Tribe	90	7/17/81
Elsie Kolstad	Tribes	Title Examiner	90	7/17/81
Keith Higginson	Tribes	Water Resources Engineer	91-92	7/27/81
Ronald Bliesner	Tribes	Irrigation Engineer	93-94 98	7/28-29/81 9/1/81
Lyman Willardson	Tribes	Irrigation and Drainage Engineer	95-96	7/29-30/81
Jack Keller	Tribes	Agricultural and Irrigation Engineer	97	7/30/81
Ronald Cummings	Tribes	Agricultural and Water Resource Economics	98-99	9/1/81
Omar Stewart	Tribes	Anthropologist	100-101	9/2/81
Leonard Rice	Wyoming	Water Engineer	102-104	9/3-4/81

Gordon Fassett	Wyoming	Water Resources Engineer	104-106 108-115 128 162	9/4-21/81 9/23-29/81 10/21/81 12/17/81
James Voeller	Wyoming	Engineer and Surveyor	115; 162 164	9/29/81 12/17-18/81
Clarence Fowkes	Wyoming	Soil Scientist	116-118	9/30-10/1/81
Stephen Martin	Wyoming	Terrestrial Ecologist	124	10/6/81
Thomas Keith	Wyoming	Environmental Planner	126	10/20/81
Gary Watts	Wyoming	Natural Resource Economics	127	10/20/81
John Dozzi	Wyoming	Aerial Photography	128	10/21/81
David McRobbie	Wyoming	Land Surveyor	129	10/22/81
Robert Brogden	Wyoming	Groundwater Geology	130-131	11/9/81
Robert Carver	Wyoming	Livestock Operations, Management & Economics	131-133	11/9-10/81
Floyd Bishop	Wyoming	Water Resource Engineer	133 148-149	11/10/81 12/3-4/81
Mike Hamel	Wyoming	Project Manager	134-135	11/12/81
Charles Reher	Wyoming	Dendrochronologist and Dendroclimatologist	136	11/13/81
Henry Sostrom	Wyoming	Civil Engineer	137-142 144-148	11/16-20/81 12/1-3/81
Paul Wilson	Wyoming	Historical Geography	143-144	12/1/81
Delbert McOmie	Lander	Mayor of Lander	150	12/7/81
Robert Nunn	Lander	Surveyor	150	12/7/81

Pete Allen	Lander	Public Works Director	150	12/7/81
Fred Heryford	Lander	Superintendant, Wyoming State Training School	150	12/7/81
Walter Ellis	Lander	Rancher, Farmer	150	12/7/81
Tom Reed	Self	Rancher	151	12/7/81
Bill Hamilton	Self	President, Taylor Ditch Co.	151	12/7/81
Fred Brownlee	Lander	District Director, Farmers Home Administration	151	12/7/81
John Longfellow	Self	Farmer	151	12/7/81
Bill Peterson	Riverton	City Administrator	151	12/7/81
Lowell Lund	Self	Commissioner, LeClair Irrigation District	151	12/7/81
Jack Long	Riverton	Manager, Midvale Irrigation District	151	12/7/81
Gideon Davison	Riverton	Commissioner, Riverton Valley Irrigation District	152	12/8/81
Billy Daniels	Self	Rancher	152	12/8/81
Carl Duane Rush	Self	Farmer	152	12/8/81
Joseph Campbell	Self	Rancher	152	12/8/81
Matt Brown	Self	Rancher	153	12/8/81
Glen Yeager	Several Defendants	Consultant, Holly Sugar	153	12/8/81
Willard Wilson	Self	President, Owl Creek Irrigation District	153	12/8/81

Landis Webber	Self	Rancher	153 156	12/8/81 12/14/81
Daniel Healy	Self	Pesident, L.U. Sheep Co.	153	12/8/81
Blaine Pound	Several Defendants	Representative, Burlington Northern Railroad	153	12/8/81
Donald Becker	Several Defendants	Vice President, Federal Land Bank Assoc. of Wyoming	153	12/8/81
Glenn Swing	Self	Director, Lower Hanover Canal	153	12/8/81
Jonathan Davis	Self	Farmer	153	12/8/81
Don Schlenker	Self	Farmer and Rancher	153	12/8/81
J. Owen Evert	Self	Director, Lower Hanover Canal Association	154	12/9/81
Langford Keith	Self	Rancher	154	12/9/81
Edward Shaffer	Langford Keith	Manager, HD Ranch	154	12/9/81
Maurice Allen	Self	Rancher	154	12/9/81
Wally Shaffer	Several Defendants	Hot Springs County Assessor	154	12/9/81
Lee Ballenger	Several Defendants	Cody Canal Irrigation District	154	12/9/81
Hugh Currah	Several Defendants	Chairman of the Board, Cody Canal Irrigation District	154	12/9/81
Bob Hicks	Several Defendants	Manager, Lakeview Irrigation District	154	12/9/81
Shirley Bales	Self	Farmer	154	12/9/81

Beryl Churchill	Self	Farmer	154	12/9/81
Bruce Murray	Self	Farmer	155	12/9/81
Chester Zwemer	Self	Farmer	155	12/9/81
Burchill Hopkin	Self	Director, Elk Water Users Association	155	12/9/81
Dueanne Calvin	Several Defendants	Project Manager, Shoshone and Heart Mountain Irrigation District	155	12/9/81
Eric Loloff	Several Defendants	Loan Officer, First National Bank of Powell	155	12/9/81
David Brookshire	Wyoming	Natural Resource Economics	157-158	12/14-15/81
James Jacobs	Wyoming	Agricultural Economist	159-160	12/15-16/81
Robert Bryans	Wyoming	Director, First Wyoming Bank	161	12/16/81
James Sinning	Wyoming	Fisheries Biologist and instream flow methodology	163	12/17/81
Stephen Goldfeld	United States	Economist, discount rate	165	2/19/82

APPENDIX 4

INDEX OF EXHIBITS

EXHIBIT NO.	INTRODUCED BY - WITNESS	DATE	ADMITTED	PAGE IN TRANSCRIPT	DESCRIPTION OF EXHIBIT
MASTER'S EXHIBIT 1	Master	9/24/79	yes	26	TABULATION OF ADJUDICATED WATER RIGHTS OF THE STATE OF WYOMING ON WATER DIVISION #3 - The "Blue Book".
STATE'S EXHIBITS C-10081 thru C-9924	State of Wyoming - White	9/24/79	yes	35	Certified certificates of appropriation accompanied by pages from the Blue Book locating where the certificates are taken - Exhibit Nos. listed are as they appear on State's pleading "Wyoming's List of its C-Series Exhibits in Numerical Order".
MASTER'S EXHIBIT 2	Master	9/24/79	yes	65-67	Materials from U.S. Statement of Geographic Boundaries and attachments thereto - mainly a reference exhibit.
STATE'S EXHIBIT 1	State of Wyoming - Palma	11/14/79	yes	25-introduced 27-admitted	Letter to Surveyor General re: Statute at Large, 1875, Session 2, Chapter 129, 343, 363 re: boundaries of Wind River Indian Reservation and authorization to survey.
STATE'S EXHIBIT 2	State of Wyoming - Palma	11/14/79	yes	28	Map showing portions surveyed of Wind River Indian Reservation.
STATE'S EXHIBIT 3	State of Wyoming - Palma	11/14/79	offered, no objection, but not formally admitted	29, et seq.	Maps from U.S. Archives setting out townships within Reservation and ranges and subdivisions - introduced for purpose of State's motion for more definite statement of U.S. claims.
WYO EXHIBIT AP-1	State of Wyoming - White	11/26/79	yes	23	"Krulitz" opinion. Copy offered as an admission against interest, under WRCP 8(1)(d)(2).
PLS EXHIBIT AP-3	State of Wyoming - Christopulos	11/26/79	yes, for illustrative purposes	157-introduced 191-admitted	Map of the Big Horn River Basin - Hydrologic Unit Map of 1974.
PLS EXHIBIT AP-2	State of Wyoming - Williams	11/27/79	offered, no objection, but not formally admitted	279, et seq.	Retabulation of the list of actual exhibit numbers of the actual Certificates of Appropriation involved in the tabulation of pages introduced 9/24/79.
U.S. TRIAL DEPOSITIONS	United States - Graves	11/27/79	yes	280	Depositions of George Christopolus, Enoch Sanders, Tommy King, Charles Ruffing and Craig Cooper.

NOTE: Plaintiff's Exhibits began as "STATE'S", then changed to "WYO" and thereafter are identified as "PLS".

U.S. TRIAL DEPOSITIONS - REPORTS OF DEPONENTS	United States - Graves	11/27/79	yes	281	Copies of reports submitted to State Engineer by deponents listed above.
STATE'S EXHIBIT 1	State of Wyoming	3/20/80	yes	110	Full set of sample interrogatories made available to parties to answer U.S. Interrogatories. Introduced with respect to U.S. Motion to Compel Correction of Advice.
U.S. EXHIBIT WR-1	United States - Sleater	4/15/80	yes	34	1868 Treaty with the Shoshone and Bannocks establishing the Wind River Indian Reservation.
U.S. EXHIBIT WR-2	United States - Sleater	4/15/80	yes	34	Act of Congress of December 24, 1874 ratifying the Agreement with the Shoshones for the section of the southern part of the Reservation.
U.S. EXHIBIT WR-3	United States - Sleater	4/15/80	yes	34	Act of Congress of June 7, 1897 confirming agreement regarding Thermopolis.
PLS EXHIBIT WR-17	State of Wyoming - Voeller	4/15/80	yes	44	Resume of James D. Voeller.
PLS EXHIBIT WR-1	State of Wyoming - Voeller	4/15/80	yes	52	1868 Treaty between the Shoshone and Bannocks. Same as U.S. Exhibit WR-1.
PLS EXHIBIT WR-2	State of Wyoming - Voeller	4/15/80	yes	52	Act of Congress of December 24, 1874 ratifying agreement with Shoshone. Same as U.S. Exhibit WR-2.
PLS EXHIBIT WR-3	State of Wyoming - Voeller	4/15/80	yes	52	Act of Congress confirming Thermopolis agreement. Same as U.S. Exhibit WR-3.
PLS EXHIBIT WR-4	State of Wyoming - Voeller	4/15/80	yes	52	Act of Congress of 1905 ratifying agreement between McLaughlin and Arapahoe and Shoshone Tribes ceding certain portions of the Reservation.
PLS EXHIBIT WR-5	State of Wyoming - Voeller	4/15/80	yes	52	Act of Congress of 1939 - Restoration Order.
PLS EXHIBIT WR-6	State of Wyoming - Voeller	4/15/80	yes	52	Department of Interior Restoration Order of April 12, 1944.
PLS EXHIBIT WR-7	State of Wyoming - Voeller	4/15/80	yes	52	Department of Interior Restoration Order of September 19, 1944.
PLS EXHIBIT WR-8	State of Wyoming - Voeller	4/15/80	yes	52	Department of Interior Public Land Order of Restoration of July 22, 1972.

PLS EXHIBIT WR-9	State of Wyoming - Voeller	4/15/80	no	52-59	Illustration of dates and orders regarding Wind River Indian Reservation boundaries.
PLS EXHIBIT WR-10	State of Wyoming - Voeller	4/15/80	yes	72	Map of Reservation, depicting the original boundary and the present boundary.
PLS EXHIBIT WR-10A	State of Wyoming - Voeller	4/15/80	yes	72	Overlay for WR-10, showing lands in green which were allegedly ceded.
PLS EXHIBIT WR-10B	State of Wyoming - Voeller	4/15/80	yes	72	Overlay for WR-10, showing Riverton project, several restoration boundaries, and the Arapahoe Ranch.
PLS EXHIBIT WR-15	State of Wyoming - Voeller	4/15/80	yes	77	Composite map which delineates boundary of Reservation, restorations of 1944, 1945 and 1974, and the Riverton project.
PLS EXHIBIT WR-11	State of Wyoming - Voeller	4/15/80	yes	88	Legal description of the Wind River Indian Reservation lands in the 1868 Treaty less land allegedly ceded March 3, 1905.
PLS EXHIBIT WR-12	State of Wyoming - Voeller	4/15/80	yes	91	Legal description of Reservation land contained in secretarial order of August 9, 1944. Taken from WR-6.
PLS EXHIBIT WR-13	State of Wyoming - Voeller	4/15/80	yes	91	Legal description of Reservation land contained in secretarial order of February 4, 1945. Taken from WR-7.
PLS EXHIBIT WR-14	State of Wyoming - Voeller	4/15/80	yes	91	Legal description of Reservation land contained in public land order of July 23, 1974. Taken from WR-8.
PLS EXHIBITS WR-9 revised, WR-10 revised, WR-10A revised, WR-10B revised, WR-15 revised	State of Wyoming - Voeller	4/16/80	yes	104	Revised versions of WR-9, -10, -10A, -10B and -15, deleting legal conclusions from the exhibits.
U.S. EXHIBIT WR-10	United States - Iverson	4/16/80	yes	148	Act of 1916 authorizing Secretary of Interior to lease the 1905 lands for mineral development.
U.S. EXHIBIT WR-4	United States - Iverson	4/16/80	yes	161	Letter of June 11, 1910 from Sherman Coolidge to the Commissioner of Indian Affairs regarding open portion and belief that U.S. would act as a trustee for Indians.
U.S. EXHIBIT WR-14	United States - Iverson	4/16/80	yes	161	Letter of March 8, 1923 from Superintendent R. P. Haas to Commissioner of Indian Affairs.
U.S. EXHIBIT WR-16	United States - Iverson	4/16/80	yes	161	Letter of June 16, 1914 from members of the Arapahoe Tribe to the Commissioner of Indian Affairs.

U.S. EXHIBIT WR-5	United States - Iverson	4/16/80	no	172	Bill of Complaint of 1912 in the District Court of the United States: U.S. v. Wyoming State Board of Control.
U.S. EXHIBIT WR-6	United States - Iverson	4/16/80	yes	185	Two letters of correspondence between Commissioner C.J. Rhoades and E.J. Fuller in 1935.
U.S. EXHIBIT WR-7	United States - Iverson	4/16/80	yes	191	Letter of March 7, 1929 from R.P. Haas to Commissioner of Indian Affairs.
U.S. EXHIBIT WR-8	United States - Iverson	4/16/80	yes	199	Letter of March 29, 1929 from Charles H. Burke to Reuben Haas.
U.S. EXHIBIT WR-9	United States - Iverson	4/16/80	yes	203	Letter of June 12, 1914 from E.B. Merritt to the Honorable C.O. Lobeck.
U.S. EXHIBIT WR-13	United States - Iverson	4/16/80	yes	207	Letter of June 21, 1923 from Charles Burke to Reuben Haas.
U.S. EXHIBIT WR-15	United States - Iverson	4/16/80	yes	210	Letter of April 14, 1923 from E.B. Merritt to Reuben Haas.
U.S. EXHIBIT WR-17	United States - Iverson	4/16/80	no	211	Memorandum of June 15, 1929 prepared by Commissioner of Indian Affairs.
U.S. EXHIBIT WR-18	United States - Iverson	4/16/80	yes	215	Letter of 1929 from Charles Burke to O. H. Gibson.
U.S. EXHIBIT WR-19	United States - Iverson	4/16/80	yes	220	Memorandum of December 8, 1933 from William Zimmerman, Jr. to Secretary of Interior.
U.S. EXHIBIT WR-20	United States - Iverson	4/16/80	ruling reserved, later stricken	228; 373	Letter of August 10, 1934 from John Collier to Secretary of Interior. Refers to Ash Sheep.
U.S. EXHIBIT WR-21	United States - Iverson	4/16/80	yes, subject to exchange for more legible copy	232	Letter of September 18, 1934 from John Collier to Martin Overgaard. Refers to Ash Sheep.
U.S. EXHIBIT WR-22	United States - Iverson	4/16/80	yes	235	Letter of January 28, 1928 from Reuben Haas to Commissioner of Indian Affairs transmitting a grazing permit.
U.S. EXHIBIT WR-23	United States - Iverson	4/16/80	yes	238	Letter of April 22, 1927 from R. P. Haas to the Commissioner of Indian Affairs transmitting a grazing lease.
U.S. EXHIBIT WR-27	United States - Penman	4/16/80	yes	288	Grazing Lease 405 and transmittal documents.

U.S. EXHIBIT WR-28	United States - Penman	4/16/80	yes	291	Grazing Lease 409 and transmittal documents.
U.S. EXHIBIT WR-26	United States - Penman	4/16/80	yes, subject to filing of official attestation as to authenticity	294	Statement of transactions of Treasury showing class three monies to and from Treasury accounts.
U.S. EXHIBIT WR-29	United States - Penman	4/16/80	yes	300	Abstract of miscellaneous receipts. Lists all receipts received by agent during the accounting period January to March 31, 1914.
U.S. EXHIBIT WR-30	United States - Penman	4/16/80	yes	311	Agent's account current - a statement of all transaction activities during the quarter.
U.S. EXHIBIT WR-31	United States - Penman	4/16/80	yes	316	Schedule of receipts and disbursements for third quarter, 1914.
U.S. EXHIBIT WR-33	United States - Penman	4/16/80	yes	316	Appropriation Warrant #45 for use with Exhibit WR-31.
U.S. EXHIBIT WR-32	United States - Penman	4/16/80	yes	316	Notice of deposit of funds to the Treasury.
U.S. EXHIBIT WR-34	United States - Penman	4/16/80	yes	327	Group of documents similar to WR-26 through 33. All for fourth quarter 1914 fiscal year.
U.S. EXHIBIT WR-35	United States - Penman	4/16/80	yes	327	Group of documents including leases, receipts, account current, auditor's statement and notice of deposit for first quarter 1915 fiscal year.
U.S. EXHIBIT WR-36	United States - Penman	4/16/80	yes	327	Group of documents including leases, receipts, account current, auditor's statement and notice of deposit for second quarter 1915 fiscal year.
U.S. EXHIBIT WR-37	United States - Penman	4/16/80	yes	327	Group of documents including receipts, vouchers and leases, account current, auditor's statement and notice of deposit for second quarter 1916 fiscal year.
U.S. EXHIBIT WR-38	United States - Penman	4/16/80	withdrawn	337	Color-coded legend of the leases of the Reservation representing the leased areas in evidence.
U.S. EXHIBIT WR-38A	United States - Penman	4/16/80	withdrawn	337	Map accompanying WR-38, covering leases for the period 1916 and 1917.
U.S. EXHIBIT WR-38B	United States - Penman	4/16/80	withdrawn	337	Map accompanying WR-38, covering leases for the period 1913 and 1915.

WYO EXHIBIT WR-16	State of Wyoming - Penman	4/16/80	no, used for voir dire	333	Plat map of Wind River Indian Reservation. Same as Attachment B of United States' Statement of Claims.
WYO EXHIBIT WR-20, WR-20A, WR-20B	State of Wyoming - White	4/17/80	no, submitted in aid of stipulation	350	Exhibits identical to U.S. Exhibits WR-38, WR-38A and WR-38B.
U.S. EXHIBIT WR-39	United States - Oakes	4/17/80	yes	365	Restoration Order of October 27, 1948 of certain portions of the ceded land on the Reservation.
U.S. EXHIBIT WR-41	United States - Oakes	4/17/80	yes	366	Restoration Order of April 17, 1940 of certain portions of ceded land on Reservation.
U.S. EXHIBIT WR-40	United States - Oakes	4/17/80	yes	377	Restoration Order of August 10, 1934 of formerly Indian lands back to Tribal ownership.
U.S. EXHIBIT WR-42	United States - Oakes	4/17/80	yes	378	Restoration Order of August 28, 1942 of certain portions of ceded land on Reservation.
U.S. EXHIBIT WR-43	United States - Oakes	4/17/80	yes	379	Restoration Order of November 12, 1942 restoring lands to Tribal ownership.
U.S. EXHIBIT WR-44	United States - Oakes	4/17/80	yes	379	Restoration Order of February 2, 1945. Depicted in blue on Wyo. Exhibits WR-10, 10A, 10B and 15 revised.
U.S. EXHIBIT WR-45	United States - Oakes	4/17/80	yes	381	Restoration Order of May 29, 1945.
PLS EXHIBIT BD-2	State of Wyoming - White	4/17/80	no	424	Status sheets used in opening Statement of Wyoming to illustrate flow of State's case.
PLS EXHIBIT BD-1	State of Wyoming - White	4/17/80	no	424	Illustration of reservations yet to be tried regarding dates and boundaries. Not intended as evidence.
U.S. EXHIBIT SNF-22	United States - Sleater	4/17/80	not offered	426	Map of Shoshone National Forest.
U.S. EXHIBIT SNF-1	United States - Sleater	4/17/80	yes	451	Statute at Large of March 1, 1872, establishing initial part of Reservation as a part of Yellowstone National Park.
WYO EXHIBIT BD-4	State of Wyoming - Merrill	4/17/80	not offered	430	Partial copy of September 24, 1979 transcript wherein ten day rule was sought by U.S. for introduction of exhibits and witnesses.
WYO EXHIBIT BD-5	State of Wyoming - Merrill	4/17/80	not offered	434	Partial copy of March 20, 1980 transcript wherein U.S. insists on observance of ten day rule.

U.S. EXHIBIT SNF-2	United States - Sleater	4/17/80	yes	455	Proclamation by President Harrison of March 30, 1891. Establishment of Yellowstone Park Timberland Reserve.
U.S. EXHIBIT SNF-3	United States - Sleater	4/17/80	yes	455	Proclamation by President Harrison of September 10, 1891. Redescription of lands stated in Exhibit SNF-2.
U.S. EXHIBIT SNF-4	United States - Sleater	4/17/80	yes	458	Proclamation by President Cleveland of February 22, 1897.
U.S. EXHIBIT SNF-5	United States - Sleater	4/17/80	yes	458	Act of June 4, 1897, 30 Stat. at Large 34, regarding proclamation in SNF-4.
U.S. EXHIBIT SNF-6	United States - Sleater	4/17/80	yes	459	Presidential Proclamation of Theodore Roosevelt of May 22, 1902.
U.S. EXHIBIT SNF-7	United States - Sleater	4/17/80	yes	460	Presidential Proclamation of Theodore Roosevelt of June 13, 1902.
U.S. EXHIBIT SNF-8	United States - Sleater	4/17/80	yes	461	Presidential Proclamation of Theodore Roosevelt of January 29, 1903.
U.S. EXHIBIT SNF-9	United States - Sleater	4/17/80	yes	461	Presidential Proclamation of Theodore Roosevelt of May 4, 1904.
U.S. EXHIBIT SNF-10	United States - Sleater	4/17/80	yes	468	Presidential Proclamation of Theodore Roosevelt of March 2, 1907.
WYO EXHIBIT SD-11	State of Wyoming - Merrill	4/17/80	yes	468	Copy of U.S. Exhibit SNF-10 which U.S. gave to State.
U.S. EXHIBIT SNF-11	United States - Sleater	4/17/80	yes	469	Executive Order of July 1, 1908. Discontinued use of name Yellowstone Forest Reserve.
U.S. EXHIBIT SNF-12	United States - Sleater	4/17/80	yes	469	Another Executive Order of July 1, 1908, which is a companion to Exhibit SNF-11.
U.S. EXHIBIT SNF-13	United States - Sleater	4/17/80	yes	469	Presidential Proclamation of June 30, 1911. Changed portion of Bonneville National Forest.
U.S. EXHIBIT SNF-14	United States - Sleater	4/17/80	Judicial notice taken	470	Presidential Proclamation of Taft of June 30, 1911.
U.S. EXHIBIT SNF-15	United States - Sleater	4/17/80	yes	473	Presidential Proclamation of Wilson of June 30, 1916.
STATE EXHIBIT SD-12	State of Wyoming - Merrill	4/17/80	yes	473	State's copy of U.S. Exhibit SNF-15.

U.S. EXHIBIT SNF-16	United States - Sleator	4/17/80	yes	474	Act of December 20, 1921. 42 Statute at Large 350.
U.S. EXHIBIT SNF-17	United States - Sleator	4/17/80	yes	474	Act of June 14, 1926. 42 Statute at Large 742.
U.S. EXHIBIT SNF-18	United States - Sleator	4/17/80	yes	475	Act of March 14, 1927. 45 Statute at Large 1412.
U.S. EXHIBIT SNF-19	United States - Sleator	4/17/80	yes	476	Act of March 1, 1929. 45 Statute at Large 1435.
U.S. EXHIBIT SNF-20	United States - Sleator	4/17/80	yes	477	Act of March 4, 1931. Appendix 23 to Statement of Claims.
U.S. EXHIBIT SNF-21	United States - Sleator	4/17/80	yes	478	Public Land Order 296, October 5, 1945. 10 FR 13077. Changed name from Washakie to Shoshone National Forest.
WYO EXHIBIT NFS-1	State of Wyoming - Braman	4/17/80	yes	498	Exhibit prepared listing assumptions made in analysis of Shoshone National Claims
WYO EXHIBIT NFS-2	State of Wyoming - Braman	4/17/80	yes	506	Map showing historical progression of determination of Reservation.
WYO EXHIBIT NFS-2A	State of Wyoming - Braman	4/17/80	yes	506	Overlay for NFS-2. Introduced to map out Appendix 11 of Statement of Claims.
WYO EXHIBIT NFS-2B	State of Wyoming - Braman	4/17/80	yes	506	Overlay for NFS-2. Introduced to map out Appendix 12 and 13 of Statement of Claims.
WYO EXHIBIT NFS-2C	State of Wyoming - Braman	4/17/80	yes	506	Overlay for NFS-2. Introduced to map out Appendix 14 of the Statement of Claims.
WYO EXHIBIT NFS-2D	State of Wyoming - Braman	4/17/80	yes	506	Overlay for NFS-2. Introduced to map out Appendix 16 of the Statement of Claims.
WYO EXHIBIT NFS-2E	State of Wyoming - Braman	4/17/80	yes	506	Overlay for NFS-2. Introduced to map out Appendix 17 of the Statement of Claims.
WYO EXHIBIT NFS-2F	State of Wyoming - Braman	4/17/80	yes	506	Overlay for NFS-2. Introduced to map out Appendix 18 of the Statement of Claims.
WYO EXHIBIT NFS-2G	State of Wyoming - Braman	4/17/80	yes	506	Overlay for NFS-2. Introduced to map out Appendices 20, 21 and 22 of the Statement of Claims.

WYO EXHIBIT NFS-2H	State of Wyoming - Braman	4/17/80	yes	506	Overlay for NFS-2. Introduced to map out Appendices 8, 21 and 22 of the Statement of Claims.
WYO EXHIBIT NFS-3	State of Wyoming - Braman	4/17/80	yes	509	Map prepared from NFS-2 and overlays showing all tracts.
WYO EXHIBIT NFS-4	State of Wyoming - Braman	4/17/80	yes	519	Series of legal descriptions derived from appendices to Statement of Claims.
PLS EXHIBITS A through E	State for Wyoming - White	4/18/80	not offered	570	Copy of interrogatories served by U.S. on private parties and the State of Wyoming.
MOVANT'S EXHIBIT G	State of Wyoming - Voelker	4/18/80	yes, for illustrative purposes	602	Map representing reservations and claims submitted by United States as understood by State of Wyoming.
MOVANT'S EXHIBIT I	State of Wyoming - Fassett	4/18/80	yes, for illustrative purposes	608	Annotated copy of the interrogatories in question.
MOVANT'S EXHIBIT J	State of Wyoming - Fassett	4/18/80	yes, for illustrative purposes	619	Map depicting State's understanding of U.S. claims for instream flow.
MOVANT'S EXHIBIT L	State of Wyoming - Fassett	4/18/80	yes, for illustrative purposes	619	Map of stream segment out of Basin. Shows various U.S. claims.
PLS EXHIBIT WYO NO. 1	State of Wyoming - Billstein	6/23/80	yes, for aid in C-X	127	List of ditches examined by Ron Billstein on Nowood Creek.
U.S. EXHIBIT SC-1	United States - O'Grady	6/23/80	yes	155-introduced 167-admitted	Tabulation by Michael O'Grady of the actual irrigated lands on a section of the Owl Creek drainage.
U.S. EXHIBIT SC-2	United States - O'Grady	6/23/80	yes	155-introduced 167-admitted	Tabulation by Michael O'Grady of the actual irrigated lands v. actual adjudicated acreage on section of Nowood River.
TRIBES EXHIBIT M-1	The Tribes - Kolstad	7/18/80	yes	69-introduced 77-admitted	Map of Wind River Indian Reservation, depicting land held in fee, in trust for Tribes, and in trust for individual Indians.
TRIBES EXHIBIT M-2	The Tribes - Kolstad	7/18/80	yes	78-introduced 83-admitted	Overlay for M-1 showing lands currently held in trust that had once been fee lands.
TRIBES EXHIBIT M-3	The Tribes - Kolstad	7/18/80	yes	88-introduced 94-admitted	Overlay for M-2 showing lands on base map owned in fee which the Tribes sold mineral interests on.

TRIBES FOLDER WR-5, 6, 7, 18, and 21	The Tribes - Iverson	7/18/80	accepted into record	pp. 102-113	Package of exhibits introduced for clarification of points raised in April hearings, 1980, as to certain exhibits. Relate to U.S. Exhibits WR-6, WR-21, WR-17, WR-18 and WR-5.
TRIBES EXHIBIT NO. 1	The Tribes - Facciola	7/18/80	yes	113-introduced 124-admitted	Certified copy of letter from Samuel Adams to the Honorable Mondell regarding the Duncan case.
TRIBES EXHIBIT NO. 2	The Tribes - Faccinla	7/18/80	yes	114-introduced 124-admitted	Record of case of U.S. v. Hampleman. The second Duncan case.
TRIBES EXHIBIT NO. 3	The Tribes - Faccinla	7/18/80	yes	115-introduced 124-admitted see also 314	Letter from Reeves to Merritt of January 16, 1919.
PLS EXHIBIT WR-33.9	State of Wyoming - Iverson	7/21/80	yes	133-introduced 134-admitted	Copy of the Carey Act statute.
PLS EXHIBIT WR-33.4	State of Wyoming - Iverson	7/21/80	yes	136-introduced 138-admitted	Act of Congress of 1953. Regards payment to Tribes for 1905 lands.
PLS EXHIBIT WR-31.1904-2	State of Wyoming - Iverson	7/21/80	yes	146-introduced 158-admitted	Certified copy of transcripts and minutes from 1904 negotiations which lead to the 1905 agreement.
PLS EXHIBIT WR-33.3D	State of Wyoming - Iverson	7/21/80	yes	148-introduced 159-admitted	Presidential Proclamation of June 2, 1906, opening certain ceded lands.
PLS EXHIBIT WR-36.15	State of Wyoming - Iverson	7/21/80	yes	167-introduced 169-admitted	Letter of August 11, 1904 to Walter Hill from Acting Commissioner of Indian Affairs.
PLS EXHIBITS WR-20, WR-20.8582 thru WR-20.3220	State of Wyoming - Voeller	7/21/80	yes	180-introduced 182-admitted	Certified applications filed on behalf of the Indians between the period of 1905 to 1915. WR-20 is a cover certificate listing by permit numbers the various applications contained in Exhibits.
PLS EXHIBIT WR-22C	State of Wyoming - Voeller	7/21/80	yes	187-introduced 188-admitted	Bar graph indicating water right applications filed on behalf of Indians for the period 1895 to 1915.
PLS EXHIBIT WR-22D	State of Wyoming - Voeller	7/21/80	yes	188-introduced 193-admitted	Color coded map showing general location of lands claimed by 109 permits listed in Exhibit WR-20.
PLS EXHIBIT WR-22B	State of Wyoming - Voeller	7/21/80	yes	193-introduced 196-admitted	Mass diagram showing cumulative progression of land for which permits were applied.
PLS EXHIBIT WR-32-8	State of Wyoming - White	7/21/80	yes	198-introduced 202-admitted	Map of Wyoming dated 1892, prepared by Department of Interior Land Office.

PLS EXHIBITS WR-19A through WR-19G	State of Wyoming - Voeller	7/22/80	yes	243-introduced 249-admitted	Legal descriptions for lands covered in Restoration Orders contained in PLS Exhibits WR-18A through 18G.
PLS EXHIBIT WR-15B	State of Wyoming - Voeller	7/22/80	no	250-introduced 254-offered	Consolidated legal description of lands contained in Reservation by priority dates.
PLS EXHIBITS WR-20.1432E, WR-20.7371, WR-20.7372, WR-20.7373	State of Wyoming - Voeller	7/22/80	yes	308-introduced 311-admitted	Certified copies of permit applications. Permits were raised by United States in cross-examination regarding the application for water on the Reservation.
PLS EXHIBIT WR-32.15	State of Wyoming - White	7/22/80	yes	312-admitted	Map of Wyoming dated 1923, prepared by Department of Interior Land Office.
TRIBES	The Tribes - Facciola	7/22/80	yes	315-admitted	Letter from Secretary Samuel Adams to Attorney General. Requests the bringing of the Duncan case.
PLS EXHIBIT WR-30.1914.8	State of Wyoming - White	7/22/80	yes	317-admitted	Letter of December 7, 1914 from Secretary of Interior to the President of the Senate. Discusses the Hampleman case.
U.S. EXHIBIT WRIRC-2	United States - Harbour	1/26/81	yes	69-introduced 70-admitted	Resume of Richard Harbour.
U.S. EXHIBIT WRIRC-3	United States - Harbour	1/26/81	yes	76-introduced 83-admitted	Satellite photo of Wind River Indian Reservation by infrared photography.
U.S. EXHIBIT WRIRC-4	United States - Harbour	1/26/81	yes	85-introduced 89-admitted	Map of Wind River Indian Reservation showing different elevations.
U.S. EXHIBIT WRIRC-5	United States - Harbour	1/26/81	yes	89-introduced 94-admitted	Map of Reservation showing Federal Indian projects.
U.S. EXHIBIT WRIRC-6	United States - Harbour	1/26/81	yes	106-introduced 107-admitted	Excerpt from C.F.R. Title 23.
U.S. EXHIBIT WRIRC-7	United States - Harbour	1/26/81	yes	110-introduced 113-admitted	Map of Reservation outlining aesthetic areas as claimed by the United States.
U.S. EXHIBIT WRIRC-8	United States - Merchant	1/26/81	not offered	182-introduced	Description of projects completed by Dornbusch and Co.
U.S. EXHIBIT WRIRC-9	United States - Merchant	1/26/81	yes	194-introduced 198-admitted	Summary of two feed rations for 450 lb. calves.

PLS EXHIBIT WR-32-9	State of Wyoming - White	7/21/80	yes	198-introduced 202-admitted	Map of Wyoming dated 1897, prepared by Department of Interior Land Office.
PLS EXHIBIT WR-32-10	State of Wyoming - White	7/21/80	yes	199-introduced 202-admitted	Map of Wyoming dated 1907, prepared by Department of Interior Land Office.
PLS EXHIBIT WR-32-12	State of Wyoming - White	7/21/80	yes	199-introduced 202-admitted	Map of Wyoming dated 1912, prepared by Department of Interior Land Office.
PLS EXHIBIT WR-32-11	State of Wyoming - White	7/21/80	yes	199-introduced 202-admitted	Map of Wyoming dated 1938, prepared by the State Planning Board.
PLS EXHIBIT WR-32-13	State of Wyoming - White	7/21/80	yes	199-introduced 202-admitted	Map of Wyoming dated 1932, State road map.
PLS EXHIBIT WR-32-14	State of Wyoming - White	7/21/80	yes	199-introduced 202-admitted	Map of Wyoming dated 1933, State road map.
PLS EXHIBIT WR-18A	State of Wyoming - Voeller	7/21/80	yes	204-introduced 206-admitted	Restoration Order of August 28, 1942.
PLS EXHIBIT WR-18B	State of Wyoming - Voeller	7/21/80	yes	204-introduced 206-admitted	Restoration Order of November 12, 1942.
PLS EXHIBIT WR-18C	State of Wyoming - Voeller	7/21/80	yes	204-introduced 206-admitted	Restoration Order of April 26, 1943.
PLS EXHIBIT WR-18D	State of Wyoming - Voeller	7/21/80	yes	204-introduced 206-admitted	Restoration Order of June 1, 1943.
PLS EXHIBIT WR-18E	State of Wyoming - Voeller	7/21/80	yes	204-introduced 206-admitted	Restoration Order of May 29, 1945.
PLS EXHIBIT WR-18F	State of Wyoming - Voeller	7/21/80	yes	204-introduced 206-admitted	Restoration Order of October 27, 1948.
PLS EXHIBIT WR-18G	State of Wyoming - Voeller	7/21/80	yes	204-introduced 206-admitted	Public Law 284, Act of Congress, August 15, 1953.
PLS EXHIBIT WR-9A	State of Wyoming - Voeller	7/21/80	yes	207-introduced 214-admitted	Revised schematic illustrating Reservation restorations.
PLS EXHIBIT WR-10C	State of Wyoming - Voeller	7/21/80	yes	214-introduced 218-admitted	Overlay for WR-10, showing Restoration Orders reflected on Exhibits WR-18A through 18G.
PLS EXHIBIT WR-15A	State of Wyoming - Voeller	7/21/80	yes	219-introduced 221-admitted	Composite map showing seven additional restorations.

U.S. EXHIBIT WRIRC-10	United States - Merchant	1/26/81	yes	198-introduced 227-admitted	Summary of two feed rations for 1,000 lb. pregnant cow in last third of pregnancy.
U.S. EXHIBIT WRIRC-11	United States - Merchant	1/26/81	yes	200-introduced 227-admitted	Summary of two feed rations for 825 lb. pregnant Heifer in last 3 to 4 months of pregnancy.
U.S. EXHIBIT WRIRC-12	United States - Merchant	1/26/81	yes	203-introduced 227-admitted	Single fee ration of an 1800 lb. bull.
U.S. EXHIBIT WRIRC-13	United States - Merchant	1/26/81	yes	235-introduced 246-admitted	Table showing animals sold, sale weight, price per 100 weight, and other pertinent matters regarding sales.
U.S. EXHIBIT WRIRC-14	United States - Merchant	1/27/81	yes	272-introduced 278-admitted	Winter feed requirements on 250 cow ranch. Totals taken from WRIRC-9 through 13.
U.S. EXHIBIT WRIRC-14A	United States - Merchant	1/27/81	yes	286-introduced 290-admitted	Livestock range area.
U.S. EXHIBIT WRIRC-15	United States - Merchant	1/27/81	yes	290-introduced 323-admitted see also 345	Annual economic costs of livestock enterprise.
U.S. EXHIBIT WRIRC-15A	United States - Merchant	1/27/81	withdrawn	318-introduced 324-withdrawn see also 345	Uncorrected version of WRIRC-15.
U.S. EXHIBIT WRIRC-16	United States - Merchant	1/27/81	yes	345-introduced 357-admitted	Annual net returns to a livestock enterprise - returns, costs, and returns to operator and labor.
U.S. EXHIBIT WRIRC-17	United States - Merchant	1/27/81	yes	374-introduced 395-admitted	Table of distribution of livestock and livestock water requirements by Watershed.
U.S. EXHIBIT WRIRC-18	United States - Merchant	1/27/81	yes	403-introduced 432-admitted	Table of population, current and projected, for Reservation.
U.S. EXHIBIT WRIRC-19	United States - Merchant	1/27/81	yes	433-introduced 436-admitted	Map of population on community water systems.
U.S. EXHIBIT WRIRC-20	United States - Merchant	1/27/81	yes	438-introduced 457-admitted	Per capita water use table.
U.S. EXHIBIT WRIRC-21	United States - Merchant	1/27/81	no	458-introduced 463-denied	Table of annual water requirements for municipal, domestic and commercial water needs for Reservation.
U.S. EXHIBIT WRIRC-22	United States - Merchant	1/28/81	yes	494-introduced 515-admitted	Map of oil reserves and enhanced recovery operations.

U.S. EXHIBIT WRIRC-23	United States - Merchant	1/28/81	yes	517-introduced 536-admitted	Natural gas reserves and processing map.
U.S. EXHIBIT WRIRC-24	United States - Merchant	1/28/81	yes	550-introduced 566-admitted	Map of coal recovery areas and conversion facilities.
U.S. EXHIBIT WRIRC-25	United States - Merchant	1/28/81	yes	569-introduced 571-admitted	Map of uranium recovery and processing.
U.S. EXHIBIT WRIRC-26	United States - Merchant	1/28/81	yes	575-introduced 580-admitted	Map of phosphate rock recovery and processing.
U.S. EXHIBIT WRIRC-27	United States - Merchant	1/28/81	yes	586-introduced 592-admitted	Map of gypsum recovery and wallboard manufacturing.
U.S. EXHIBIT WRIRC-28	United States - Merchant	1/28/81	yes	592-introduced 595-admitted	Overall map of mineral deposits and processing.
U.S. EXHIBIT WRIRC-29	United States - Merchant	1/28/81	yes	596-introduced 608-admitted	Table by mineral of development, existing and contemplated. Also includes anticipated water requirements.
U.S. EXHIBIT WRIRC-30	United States - Merchant	1/28/81	yes	609-introduced 611-admitted	Resume of James Merchant.
WYO EXHIBIT IN AID OF CROSS-EXAMI-NATION OF MERCHANT I	State of Wyoming - Merchant	1/28/81	not offered	642-identified	Copy of Average Prices of Cattle and Calves at Billings, Montana, prepared by Gordon Kearl.
U.S. EXHIBIT WRIRC-31	United States - Page	1/29/81	yes	752-admitted	Qualifications of Oliver S. Page.
U.S. EXHIBIT WRIRC-31A	United States - Page	1/29/81	yes	754-introduced 917-admitted	Tables of characteristics of rocks and deposits present on Reservation.
U.S. EXHIBIT WRIRC-32	United States - Page	1/29/81	yes	758-introduced 917-admitted	Generalized columnar section showing rock formations of Reservation.
U.S. EXHIBIT WRIRC-33	United States - Page	1/29/81	yes	758-introduced 917-admitted	Geologic map of Wind River Indian Reservation taken from the USGS.
U.S. EXHIBIT WRIRC-33A	United States - Page	1/29/81	yes	804-introduced 917-admitted	Overlay for Exhibit C-33, locating community water systems on groundwater.
U.S. EXHIBIT WRIRC-33B	United States - Page	1/29/81	yes	809-introduced 917-admitted	Overlay for Exhibit C-33, locating mineral and resource development.

PLS EXHIBIT WRIR GW-1	State of Wyoming - Page	1/30/81	not offered	1011-introduced	Copy of letter from Tribal Councils to William Moffat.
U.S. EXHIBIT WRIRC-34	United States - Kersich	2/9/81	yes	1114-introduced 1225-admitted	Resume of Al Kersich.
U.S. EXHIBIT WRIRC-35	United States - Kersich	2/9/81	yes	1123-introduced 1227-admitted	Study area land base map.
U.S. EXHIBIT WRIRC-36	United States - Kersich	2/9/81	yes	1133-introduced 1149-admitted see also 1230	Tables of land classification standards.
PLS EXHIBIT WRIR SK-2	State of Wyoming - Kersich	2/9/81	yes	1138-introduced 3194-admitted	Copy of Deposition Exhibit WYO-3 Kersich. Land classification standards used in cross-examination of Kersich.
PLS EXHIBIT WRIR SK-3	State of Wyoming - Kersich	2/9/81	yes	1142-introduced 3194-admitted	The Toedter land classification standards, taken from the Toedter depositions.
U.S. EXHIBIT WRIRC-37	United States - Kersich	2/9/81	yes	1152-introduced 1242-admitted	Map symbol code.
U.S. EXHIBIT WRIRC-38	United States - Kersich	2/9/81	yes	1159-introduced 1244-admitted	Soil textural triangle to determine textures.
U.S. EXHIBIT WRIRC-39	United States - Kersich	2/9/81	yes	1159-introduced 1247-admitted	Composite aerial photograph of a township.
U.S. EXHIBIT WRIRC-40	United States - Kersich	2/9/81	yes	1160-introduced 1253-admitted	Copy of log of Section 13, Township 4 North, Range 2 West, depicted on Exhibit C-39.
U.S. EXHIBIT WRIRC-41	United States - Kersich	2/9/81	yes	1176-introduced 1259-admitted	Arable sprinkler lands in selected study areas.
U.S. EXHIBIT WRIRC-42	United States - Kersich	2/9/81	yes	1176-introduced 1259-admitted	Arable gravity lands in selected study areas.
U.S. EXHIBIT WRIRC-43	United States - Kersich	2/9/81	yes	1180-introduced 1259-admitted	Land classification report of six study areas. Kersich report.
U.S. EXHIBIT WRIRC-44	United States - Kersich	2/9/81	yes	1185-introduced 1259-admitted	North Crowheart area study. Gravity blowup of area on Exhibit C-42.
U.S. EXHIBIT WRIRC-45	United States - Kersich	2/9/81	yes	1193-introduced 1259-admitted	Sprinkler land map of Exhibit C-44.

U.S. EXHIBIT WRIRC-46	United States - Kersich	2/9/81	yes	1195-introduced 1259-admitted	Gravity map of South Crowheart.
U.S. EXHIBIT WRIRC-47	United States - Kersich	2/9/81	yes	1195-introduced 1259-admitted	Sprinkler map of South Crowheart.
U.S. EXHIBIT WRIRC-48	United States - Kersich	2/9/81	yes	1196-introduced 1259-admitted	Gravity map of Big Horn Flats.
U.S. EXHIBIT WRIRC-49	United States - Kersich	2/9/81	yes	1196-introduced 1259-admitted	Sprinkler map of Big Horn Flats.
U.S. EXHIBIT WRIRC-50	United States - Kersich	2/9/81	yes	1196-introduced 1259-admitted	Gravity map of Riverton East.
U.S. EXHIBIT WRIRC-51	United States - Kersich	2/9/81	yes	1197-introduced 1259-admitted	Sprinkler map of Riverton East.
U.S. EXHIBIT WRIRC-52	United States - Kersich	2/9/81	yes	1197-introduced 1259-admitted	Sprinkler map for Owl Creek.
U.S. EXHIBIT WRIRC-53	United States - Kersich	2/9/81	yes	1199-introduced 1259-admitted	Gravity map for Arapahoe.
U.S. EXHIBIT WRIRC-54	United States - Kersich	2/9/81	yes	1199-introduced 1259-admitted	Sprinkler map for Arapahoe.
PLS EXHIBIT WRIR SK-4	State of Wyoming - Kersich	2/9/81	yes	1295-identified 3194-admitted	Copy of portion of 1953 Bureau of Reclamation manual. Used for cross-examination purposes.
PLS EXHIBIT WRIR SK-5	State of Wyoming - Kersich	2/9/81	yes	1298-introduced 3194-admitted	Copy of portion of 1980 Bureau of Reclamation manual.
PLS EXHIBIT WRIR SK-8	State of Wyoming - Kersich	2/9/81	yes	1310-introduced 3194-admitted	First two pages and page V.7 of the preliminary draft by HKM & Associates entitled "Inventory of Water Resources".
PLS EXHIBIT WRIR SK-7	State of Wyoming - Kersich	2/10/81	not offered	1481-introduced	Another set of land classification standards regarding the question of soil depth to barrier.
PLS EXHIBIT WRIR SK-9	State of Wyoming - Kersich	2/11/81	yes	1557-introduced 3194-admitted	Page excerpts from 1957 Special Report - Third Division - Riverton Project.
PLS EXHIBIT WRIR SK-9A	State of Wyoming - Kersich	2/11/81	yes	1564-introduced 3194-admitted	1957 Special Report - Third Division - Riverton Project: entire document.

PLS EXHIBIT WRIR SK-20	State of Wyoming - Kersich	2/11/81	yes	1572-introduced 3195-admitted	Waples Map Symbol Code, taken from deposition exhibits.
PLS EXHIBIT WRIR SK-10A	State of Wyoming - Kersich	2/11/81	yes	1602-introduced 3194-admitted	U.S. Bureau of Reclamation semi-detailed land classification map for Township 1 South, Range 4 East.
PLS EXHIBIT WRIR SK-10B	State of Wyoming - Kersich	2/11/81	not offered	1608-introduced 3189-withdrawn	Bureau of Reclamation map provided from deposition exhibits from Al Kersich.
PLS EXHIBIT WRIR SK-10	State of Wyoming - Kersich	2/13/81	yes	1812-introduced 3194-admitted	U.S. Bureau of Reclamation land classification standards for Muddy Ridge in the Big Horn District.
PLS EXHIBIT WRIR SK-30	State of Wyoming - Kersich	2/13/81	yes	1834-introduced 3195-admitted	U.S. Bureau of Reclamation semi-detailed drainage investigation map for Township 4 North, Range 1 East.
U.S. EXHIBIT WRIRC-55	United States - Billstein	3/9/81	yes	1905-introduced 2111-admitted	Map of Wind River Indian Reservation - Historic land irrigation study.
U.S. EXHIBIT WRIRC-55A	United States - Billstein	3/9/81	withdrawn	1939-introduced 1989-withdrawn	Table II - Acres in use by each photo. Relates to C-56 through C-136.
U.S. EXHIBIT WRIRC-61	United States - Billstein	3/9/81	yes	1951-introduced 2111-admitted	One of the aerial photos with overlay, showing U.S. claim areas and their evaluation by aerial photograph. introduced here for illustrative purposes as to the process used for all the exhibits in the C-56 through C-136 series.
U.S. EXHIBIT WRIRC-56	United States - Billstein	3/9/81	yes	1960-introduced 2111-admitted	Historic land use aerial photo 7-209. Shows acres in use.
U.S. EXHIBIT WRIRC-138	United States - Billstein	3/9/81	yes	1962-introduced 2123-admitted	Historic Land Study - Claims for Acres in Use. Report prepared by Billstein consolidating findings of his report.
U.S. EXHIBIT WRIRC-137	United States - Billstein	3/9/81	yes	1963-introduced 2111-admitted	Exhibit form of Table I from Exhibit C-138. "Acres in Use by Location."
U.S. EXHIBIT WRIRC-55B	United States - Billstein	3/9/81	yes	1984-introduced 2111-admitted	Table II from Exhibit C-138. "Acres in Use by Photograph." Replaces C-55A.
U.S. EXHIBIT WRIRC-139	United States - Billstein	3/9/81	yes	1985-introduced 2113-admitted	Resume of Ronald A. Billstein.
U.S. EXHIBITS WRIRC-57 through C-136	United States - Billstein	3/9/81	yes	1989-introduced 2111-admitted	Historic land use aerial photographs showing in use acreage.

PLS EXHIBIT WRIR HB-5	State of Wyoming - Billstein	3/9/81	not offered	1999-introduced	Photogrammetry, pages 70-71.
PLS EXHIBIT WRIR HB-1	State of Wyoming - Billstein	3/9/81	yes	2002-introduced 2748-admitted	Document giving a series of random checks for scale accuracy of Exhibits C-57 through C-136.
PLS EXHIBIT WRIR HB-3	State of Wyoming - Billstein	3/9/81	yes	2021-introduced 2748-admitted	BLM certified copy of Plat Map for Township 5 North, Range 5 West.
PLS EXHIBIT WRIR HB-7	State of Wyoming - Billstein	3/9/81	yes	2022-introduced 2748-admitted	Copy of BLM records of field notes of the same township as in HB-3.
PLS EXHIBIT WRIR HB-8	State of Wyoming - Billstein	3/9/81	yes	2040-introduced 2748-admitted	Table of irrigation types used for classification of irrigated lands.
PLS EXHIBIT WRIR HBC-1	State of Wyoming - Billstein	3/11/81	not offered	2148-introduced	Flow chart showing development of water rights claims by the United States for Wind River Indian Reservation.
PLS EXHIBITS WRIR HB-1061, 1064-1065, 1067 1082-1084, 1090-1091, 1097-1101, 1105-1106, 1110-1111, 1114-1115, 1122-1123, 1128-1136	State of Wyoming - Billstein	3/11-13/81	not offered	2148 through 2436-introduced	Blue line copies of overlays to U.S. Exhibits C-57 through C-136.
PLS EXHIBITS WRIR HB-2000-2012, 2012A, 2013, 2013A, and 2014	State of Wyoming - Billstein	3/16-17/81	yes	2478 through 2558-introduced 2759-admitted	Certified copies of certain Certificates of Approriation and supporting documentation.
PLS EXHIBITS WRIR HB-61	State of Wyoming - Billstein	3/17/81	yes	2618-introduced 2752-admitted	Computation sheet of totals and percentages of active types of land irrigated, prepared by Billstein.
PLS EXHIBIT WRIR HB-137-8 through 137-14, 137-16 through 137-28, 137-30, 137-32 through 137-35	State of Wyoming - Billstein	3/17/81	yes	2663 through 2675-introduced 2677-admitted	Permit Number worksheets of Billstein, showing lands included in the "in use" tabulstions of several creeks and streams.
PLS EXHIBIT WRIR HB-54	State of Wyoming - Billstein	3/18/81	yes	2711-introduced 2752-admitted	1947 Inventory of Irrigation Ditches on the Reservation. Document taken from deposition of Billstein.

PLS EXHIBIT WRIR HB-55	State of Wyoming - Billstein	3/18/81	yes	2713-introduced 2752-admitted	1980 Water User Ledger for trust acres in LeClair Irrigation District.
PLS EXHIBIT WRIR HB-50B	State of Wyoming - Billstein	3/18/81	yes	2715-introduced 2752-admitted	Complete copy, Saunder's Field Notes, Book B.
PLS EXHIBIT WRIR HB-50A	State of Wyoming - Billstein	3/18/81	yes	2717-introduced 2752-admitted	Complete copy, Johnston's Field Notes, Book A.
PLS EXHIBITS WRIR HB-11A through 13A, 15A through 20A, 22A through 47A	State of Wyoming - Billstein	3/18/81	yes	2721 through 2741-introduced 2745 and 2746-admitted	Planimeter sheets, results, interview forms, investigative notes and field notes of Billstein on several reaches.
PLS EXHIBITS WRIR HB-137-1A through 137-30A, 137-32A, 137-34A, 137-22B, 137-24B	State of Wyoming - Billstein	3/18-19/81	yes	2762 through 2833-introduced 2772 and 2883-admitted	Tabulations per stipulation identifying land types and acres for given tracts in certain reaches.
PLS EXHIBITS WRIR HB-12-1, 13-1, 16-1, and 16-2	State of Wyoming - Billstein	3/19/81	not offered	2816 through 2819-introduced	Copies of pages from exhibits used for identification on question of Circle 5 lands and non-arability determination.
PLS EXHIBIT WRIR HB-62	State of Wyoming - Billstein	3/19/81	not offered	2826-introduced	Compilation of Circle 5 lands included in Exhibit C-137. Concerns Federal Irrigation Projects.
PLS EXHIBIT WRIR HB-63	State of Wyoming - Billstein	3/19/81	not offered	2826-introduced	Compilation of pages from several A series Exhibits, covering Circle 5 lands outside Federal Irrigation Projects.
PLS EXHIBITS WRIR HB-26-2 through 26-5, and 31-1	State of Wyoming - Billstein	3/19/81	not offered	2846 through 2850-introduced	Copies of pages from exhibits for use in cross-examination for identification only.
PLS EXHIBIT WRIR HB-52	State of Wyoming	3/19/81	yes	2853-introduced 2868-admitted	Copies of irrigation facility maps used for study by Billstein.
PLS EXHIBIT WRIR HB-56	State of Wyoming - Billstein	3/19/81	yes	2860-introduced 2868-admitted	Xerox copies of assessment maps, used for review process.
PLS EXHIBIT WRIR HB-53	State of Wyoming - Billstein	3/19/81	yes	2860-introduced 2868-admitted	1968-1970 Soil Conservation Service Photography Maps. Irrigated lands inventory. Index Sheet. (Accompanied by 27 separate maps keyed to the index enclosed.)

PLS EXHIBIT WR1R HB-59	State of Wyoming - Billstein	3/19/81	yes	2863-introduced 2868-admitted	Definitions of land types included on Soil Conservation Service photographs in HB-53.
PLS EXHIBIT WRIR HB-65	State of Wyoming - Billstein	3/19/81	yes	2869-introduced 2870-admitted	Copy of telephone conversation memoranda compiled by Billstein.
PLS EXHIBIT WRIR HB-51	State of Wyoming - Billstein	3/19/81	yes	2869-introduced 2870-admitted	Copies of telephone conversation record between Gurney and Johnston.
PLS EXHIBIT WRIR HB-80	State of Wyoming - Billstein	3/19/81	not offered	2912-introduced	Portion of U.S. Answers to 8th Interrogatories. Used in cross examination of Billstein.
U.S. EXHIBIT WRIRC-142	United States - Billstein	3/19/81	yes	2936-introduced 2947-admitted	Tabulation of adjudicated acreage deletions, defined by exhibit number.
U.S. EXHIBIT WRIRC-143	United States - Billstein	3/19/81	yes	2939-introduced 2971-admitted	Fee acreage deletions, defining fee acreages deleted by exhibit number.
U.S. EXHIBIT WRIRC-144	United States - Billstein	3/19/81	yes	2940-introduced 2957-admitted	Acreage on Exhibit C-137 not shown on Exhibit by exhibit number.
U.S. EXHIBIT WRIRC-145	United States - Billstein	3/19/81	yes	2940A-introduced 2959-admitted	Acreage included in exhibits but not included in Exhibit C-137. Listed by exhibit number.
U.S. EXHIBIT WRIRC-137A	United States - Billstein	3/19/81	yes	2941-introduced 2959-admitted	"Acres in Use by Location", reflecting modifications to the original Exhibit C-137 from tabulations listed above.
U.S. EXHIBIT WRIRC-140	United States - Billstein	3/19/81	yes	2941A-introduced 2959-admitted	Table to update corresponding Table 1 in Historic Use Report of Billstein.
U.S. EXHIBIT WRIRC-141	United States - Billstein	3/19/81	yes	2941A-introduced 2959-admitted	Table to update corresponding Table 2 in Historic Use Report of Billstein.
U.S. EXHIBITS WRIRC-56A through C-136A	United States - Billstein	3/19/81	yes	2942A-introduced 2971-admitted	Work aerial photographs which are the base of U.S. Exhibits WRIRC-56 through C-136. Present greater detail than overlays located on Exhibits C-56 through C-136.
U.S. EXHIBIT WRIRC-146	United States - Echohawk	3/19/81	yes	2955-introduced 2955-admitted	Certified Deed for Harpoon Cattle Company Ranch.
PLS EXHIBIT WR1R SK-41	State of Wyoming - Kersich	4/14/81	yes	3068-introduced 3195-admitted	"Summary of Arable Lands by Class", taken from study included in U.S. Exhibit C-43.
PLS EXHIBIT WRIR SK-42	State of Wyoming - Kersich	4/14/81	yes	3074-introduced 3195-admitted	Arable Lands by Class, summary chart from page 26 of U.S. Exhibit C-43.

PLS EXHIBIT WRIR SK-40	State of Wyoming - Kersich	4/14/81	yes	3113-introduced 3195-admitted	Series 510 "Land Classification Techniques and Standards" Manual.
PLS EXHIBIT WRIR SK-50	State of Wyoming - Kersich	4/15/81	yes	3157-introduced 3195-admitted	"HKM and Associates Laboratory Procedures, Soils Chemistry Lab" - copy of HKM Laboratory Manual.
PLS EXHIBIT WRIR SK-51	State of Wyoming - Kersich	4/15/81	yes	3160-introduced 3195-admitted	Copy of memoranda from Saunders to Kersich regarding scale rectification of mosaic photos used by Kersich.
PLS EXHIBIT WRIR SK-53	State of Wyoming - Kersich	4/15/81	yes	3167-introduced 3195-admitted	Tabulations of acreage within arable lands - basis of opinion for Kersich testimony.
PLS EXHIBIT WRIR SK-52	State of Wyoming - Kersich	4/15/81	yes	3168-introduced 3195-admitted	Copy of lab report from HKM - laboratory studies of soil samples.
U.S. EXHIBIT WRIRC-151	United States - Kersich	4/15/81	yes	3216-introduced 3248-admitted	Chart showing acreage of arable land by degree of slope within study areas. Exhibit was originally introduced as U.S. Exhibit WRIRC-146. Changed in numbering to C-151, May 4, 1981.
U.S. EXHIBITS WRIRC-147A, 147B and 147C	United States - Kersich	4/15/81	yes	3218-introduced 3248-admitted	1979 Soil Logs, Drsinage Logs and Deep Hole Logs drilled by HKM.
U.S. EXHIBITS WRIRC-148-1 through C-148-30	United States - Kersich	4/15/81	yes	3219-introduced 3248-admitted	Mosaic aerial photos compiled by HKM and used in preparation of Kersich's Report. Shows acreage totals and are the photos used to derive the figures on Kersich map exhibits.
U.S. EXHIBIT WRIRC-150	United States - Kersich	4/15/81	yes	3220-introduced 3248-admitted	Preliminary draft of the HKM Report - Phase II.
U.S. EXHIBIT WRIRC-157	United States - Waples	4/16/81	yes	3291-introduced 3401-admitted	The resume of Ross Waples.
U.S. EXHIBIT WRIRC-36A	United States - Waples	4/16/81	yes	3296-introduced 3401-admitted	Land classification standards. Same standards as used in the Kersich study and Exhibit C-36.
U.S. EXHIBIT WRIRC-156	United States - Waples	4/16/81	yes	3335-introduced 3401-admitted	Land classification standards for non-project irrigated lands in the Historical Land Analysis.
U.S. EXHIBIT WRIRC-223	United States - Waples	4/16/81	yes	3346-introduced 3401-admitted	Table 8 - Historic Arable Lands Totals. For project and non-project land.
U.S. EXHIBIT WRIRC-224	United States - Waples	4/16/81	yes	3346-introduced 3401-admitted	Table 9 - Historic Arable Lands. Major irrigation projects by land classification.

U.S. EXHIBIT WRIRC-224A	United States - Waples	4/16/81	yes	3346-introduced 3401-admitted	Table 11 - Historic Arable Lands. Non-project lands by land classification.
U.S. EXHIBIT WRIRC-225	United States - Waples	4/16/81	yes	3346-introduced 3401-admitted	Table 10A - Historic Arable Lands. Major irrigation projects, keyed to set of exhibits.
U.S. EXHIBIT WRIRC-158	United States - Waples	4/16/81	yes	3348-introduced 3401-admitted	Historic Arable Lands on USDA aerial photo 6-379-226.
U.S. EXHIBIT WRIRC-222	United States - Waples	4/16/81	yes	3351-introduced 3401-admitted	Drainage Code Index Number Sheet - list of Waples' major project study areas, keyed to Exhibits C-158 through C-221.
U.S. EXHIBITS WRIRC-159 through C-221	United States - Waples	4/16/81	yes	3353-introduced 3401-admitted	Series of exhibits of Historic Arable Lands on USDA Aerial photos, as keyed and indexed by Exhibit C-222.
U.S. EXHIBIT WRIRC-226	United States - Waples	4/16/81	yes	3362-introduced 3401-admitted	Historic Lands Study, land classification of project and non-project idle lands.
PLS EXHIBIT WRIR SW-2	State of Wyoming - Waples	4/20/81	not offered	3537-introduced	U.S. Department of Interior 1953 Bureau of Reclamation Manual. Vol. 5, "Irrigated Land Use", Part II, "Land Classification".
PLS EXHIBIT WRIR SW-30	State of Wyoming - Waples	4/20/81	not offered	3540-introduced	Water and power instructions, Series 110 Planning. Part 115, Land Resource Investigations.
PLS EXHIBIT WRIR SW-1	State of Wyoming - Waples	4/20/81	not offered	3547-introduced	Inventory of Water Resources, Phase II, Needs and Uses, Preliminary Draft. Excerpt.
PLS EXHIBIT WRIR SW-5	State of Wyoming - Waples	4/20/81	not offered	3585-introduced	United States Statement of Claims, excerpt pages 1-3, 15.
PLS EXHIBIT WRIR SW-7	State of Wyoming - Waples	4/20/81	yes	3602-introduced 3686-admitted	HKM Report on Chemical Analysis of Soil. Holes 15 and 16, Tracts 7-19X.
PLS EXHIBIT WRIR SW-8	State of Wyoming - Waples	4/20/81	yes	3604-introduced 3686-admitted	Soil Profile Log Record for Hole 15, aerial photo 19-256. Corresponds to Exhibit C-208.
PLS EXHIBIT WRIR SW-9	State of Wyoming - Waples	4/20/81	yes	3605-introduced 3686-admitted	Report on chemical analysis of soils, lab number W-1493, pertains to a tract on Exhibit C-208.
PLS EXHIBIT WRIR SW-6	State of Wyoming - Waples	4/21/81	yes	3619-introduced 3686-admitted	Infiltration test report for tract 7-19X, located on photo 279-256, Hole 6.
PLS EXHIBIT WRIR SW-11	State of Wyoming - Waples	4/21/81	yes	3651-introduced 3686-admitted	Soil Profile Log for Hole 9. Regards tract 1-60X on Exhibit C-188.

PLS EXHIBIT WRIR SW-13	State of Wyoming - Waples	4/21/81	yes	3654-introduced 3686-admitted	Excerpt from Glossary of Soil Science Terms. Published by the Soil Science Society of America. May 1970.
PLS EXHIBIT WRIR SW-12	State of Wyoming - Waples	4/21/81	yes	3669-introduced 3686-admitted	Soil Profile Log for Hole 8, Photo 14-179-67, tract 1-63X on Exhibit C-188.
PLS EXHIBIT WRIR SW-14	State of Wyoming - Waples	4/21/81	yes	3673-introduced 3686-admitted	Report on Chemical Analysis of soils for tract 1-63X on Exhibit C-188.
U.S. EXHIBIT WRIRC-228A	United States - Waples	4/21/81	yes	3690-introduced 3696-admitted	1980 Land Classification Logs used for the historic study. Vol. I.
U.S. EXHIBIT WRIRC-228B	United States - Waples	4/21/81	yes	3690-introduced 3696-admitted	1980 Land Classification Logs, Vol. II.
U.S. EXHIBIT WRIRC-228C	United States - Waples	4/21/81	yes	3690-introduced 3696-admitted	Drainage logs and permeability test data for historic land study.
U.S. EXHIBITS WRIRC-227-1 through C-227-12	United States - Waples	4/21/81	admission reserved	3692-introduced 3696-reservation	Aerial photographs corresponding to Waples field work. Admission reserved because photographs were not present in the courtroom.
U.S. EXHIBIT WRIRC-230	United States - Toedter	4/21/81	yes	3708-introduced 3730-admitted	Resume of Robert J. Toedter, P.E.
U.S. EXHIBIT WRIRC-231	United States - Toedter	4/21/81	yes	3753-introduced 3890-admitted	Map of the North Crowheart Study Unit. Future lands program. Shows depth to barrier and hydraulic conductivity areas of of analysis.
U.S. EXHIBIT WRIRC-242	United States - Toedter	4/21/81	yes	3756-introduced 3890-admitted	Sketch drawn by Toedter during testimony to show steps used by him in developing depth to barrier and hydraulic conductivity analysis for drainage systems.
U.S. EXHIBIT WRIRC-241A	United States - Toedter	4/21/81	yes	3771-introduced 3890-admitted	The Wind River Drainage Analysis Depth to Barrier and Average Weighted Hydraulic Conductivity. Future lands.
U.S. EXHIBIT WRIRC-241B	United States - Toedter	4/21/81	yes	3771-introduced 3890-admitted	The Wind River Drainage Analysis Depth to Barrier and Average Weighted Hydraulic Conductivity. Historic lands.
U.S. EXHIBIT WRIRC-231A	United States - Toedter	4/21/81	yes	3779-introduced 3890-admitted	Work Map for analysis of Exhibit C-231, North Crowheart Study Unit. (This exhibit was originally numbered as C-243, but was renumbered to C-231A on page 3985 of the transcript.)
U.S. EXHIBITS WRIRC-232 through C-240	United States - Toedter	4/21/81	yes	3801 through 3808-introduced 3890-admitted	Maps of future lands study areas regarding depth to barrier and hydraulic conductivity analysis.

PLS EXHIBIT WRIR BT-2	State of Wyoming - Toedter	4/22/81	yes	3917-introduced 3973-admitted	Pages 115-118 from 1978 Bureau of Reclamation Drainage Manual.
PLS EXHIBIT WRIR BT-3	State of Wyoming - Toedter	4/22/81	yes	3920-introduced 3973-admitted	Collection of soil profile logs used in Exhibit 241B, Ray Unit No. 4.
PLS EXHIBIT WRIR BT-4	State of Wyoming - Toedter	4/22/81	yes	3921-introduced 3973-admitted	Pages 15-23 from 1978 Bureau of Reclamation Drainage Manual.
PLS EXHIBIT WRIR BT-11	State of Wyoming - Toedter	4/22/81	yes	3937-introduced 3973-admitted	Drain Spacing Curve Graphs. Analysis printout for North Crowheart, gravity lands.
PLS EXHIBIT WRIR BT-12	State of Wyoming - Toedter	4/22/81	yes	3937-introduced 3973-admitted	Drain Spacing Curve Graphs. Analysis printout for North Crowheart, sprinkler lands.
PLS EXHIBIT WRIR BT-10	State of Wyoming - Toedter	4/22/81	not offered	3955-introduced 3969-excluded	1961, 3rd Division Report of Board of Consultants, Riverton Project, Wyoming, to Regional Director, Region 6, Bureau of Reclamation.
PLS EXHIBIT WRIR BT-10A	State of Wyoming - Toedter	4/22/81	yes	3969-introduced 3973-admitted	Three pages taken from report referred to in Exhibit BT-10. Includes a map and pages 2 & 3 of that report.
U.S. EXHIBITS WRIRC-231A through C-240A	United States - Toedter	4/23/81	yes	3983-introduced 3991-admitted	Toedter Work Maps for analysis of future lands study areas.
U.S. EXHIBIT WRIRC-244	United States - Mesghinna	4/23/81	yes	4029-introduced 4043-admitted	Climatic zones of the Wind River Indian Reservation. Diagram used during Mesghinna testimony showing seven climatic zones based on weather stations in the area.
U.S. EXHIBIT WRIRC-245	United States - Mesghinna	4/23/81	not offered at time	4072-introduced	Conceptual Irrigation Development Land Report, drafted by Dr. Mesghinna for his work.
U.S. EXHIBIT WRIRC-246	United States - Mesghinna	4/23/81	yes	4098-introduced 4101-admitted	Crop Water Use. Illustration used in testimony of Dr. Mesghinna.
U.S. EXHIBIT WRIRC-247	United States - Mesghinna	4/23/81	yes	4132-introduced 4165-admitted	Side Roll Illustration - used in testimony of Dr. Meaghinna regarding sprinkler design.
U.S. EXHIBIT WRIRC-248	United States - Mesghinna	4/23/81	yes	4183-introduced 4241-admitted	Typical irrigation diversion and distribution system - illustration of pump and pumping plant.
U.S. EXHIBIT WRIRC-256	United States - Mesghinna	4/24/81	yes	4243-introduced 4276-admitted	Subsurface Drain - an illustration during testimony of Dr. Mesghinna as to drainage analysis.

U.S. EXHIBITS WRIRC-249 through C-255, and C-257 through C-263	United States - Mesghinna	4/24/81	yes	4279 through 4313-introduced 4324-admitted	Maps of conceptual irrigation development plans for future lands study areas.
U.S. EXHIBIT WRIRC-245	United States - Mesghinna	4/24/81	yes	4314-introduced 4324-admitted	Conceptual Irrigation Development Plan and Irrigation Water Requirements for Wind River Indian Reservation. Report of Dr. Mesghinna.
PLS EXHIBITS WRIR FM-1249 through 1255	State of Wyoming - Mesghinna	5/5/81	yes	4447-introduced 4449-admitted	Annotated copies of maps of future lands study areas, annotating fields with numbering system used by Dr. Mesghinna.
PLS EXHIBITS WRIR FM-1249A through 1255A	State of Wyoming - Mesghinna	5/5/81	yes	4451 and 4460-introduced 4872-admitted	Annotated copies of maps of future lands study areas, depicting Class 6 lands in orange.
PLS EXHIBIT WRIR FM-1	State of Wyoming - Mesghinna	5/5/81	yes	4517-introduced 4872-admitted	Tabulation from Mesghinna's notebook of soil classification symbols in respective water holding capacities and intake rates.
PLS EXHIBIT WRIR FM-2	State of Wyoming - Mesghinna	5/5/81	no	4534-introduced 4556-denied	Computer printout of growing season program used by Dr. Mesghinna. All copies ordered returned to Special Master.
PLS EXHIBIT WRIR FM-2 (replacement)	State of Wyoming - Mesghinna	5/5/81	yes	4578-introduced 4872-admitted	Selected pages from FM-2 showing data contained in computer printout.
PLS EXHIBIT WRIR FM-4	State of Wyoming - Mesghinna	5/5/81	yes	4566-introduced 4872-admitted	BIA Plan for completion of Wind River Irrigation Project. June 1968.
PLS EXHIBIT WRIR FM-3	State of Wyoming - Mesghinna	5/5/81	yes	4567-introduced 4872-admitted	Criteria for Section of Project Study Areas - Wind River Indian Reservation. October 1978 HKM Report.
PLS EXHIBIT WRIR FM-5	State of Wyoming - Mesghinna	5/6/81	yes	4592-introduced 4872-admitted	Record of Lander Airport meteorlogical data for 1971.
PLS EXHIBIT WRIR FM-5A	State of Wyoming - Mesghinna	5/6/81	not offered	4597-introduced 4601-withdrawn	Compilation of solar radiation data provided to Dr. Mesghinna by HKM.
PLS EXHIBIT WRIR FM-6	State of Wyoming - Mesghinna	5/6/81	yes	4606-introduced 4872-admitted	Record of Lander Airport meteorlogical data for 1972.
PLS EXHIBIT WRIR FM-8	State of Wyoming - Mesghinna	5/6/81	yes	4629-introduced 4872-admitted	Pages from Consumptive Use of Water and Irrigation Water Requirements. American Society of Civil Engineers.
PLS EXHIBIT WRIR FM-9	State of Wyoming - Mesghinna	5/6/81	yes	4672-introduced 4872-admitted	Excerpt of Bureau of Reclamation Manual regarding canal lining policy - Canals and Related Structures, Chapter 1.

PLS EXHIBIT WRIR FM-10	State of Wyoming - Mesghinna	5/6/81	yes	4687-introduced 4872-admitted	Blue Line Copy of HKM Hole Log regarding Coolidge extension, hole 32.
PLS EXHIBIT WRIR FM-15	State of Wyoming - Mesghinna	5/6/81	yes	4701-introduced 4872-admitted	Blue Line Copy of HKM Hole Log regarding North Crowheart.
PLS EXHIBIT WRIR FM-5A	State of Wyoming - Mesghinna	5/7/81	yes	4847-introduced 4872-admitted	Percentage of possible sunshine. Sample of data provided to Dr. Mesghinna. Intended to replace Exhibit FM 5-A introduced on Tr. p. 4597.
PLS EXHIBITS WRIR FM-100 thru FM-129	State of Wyoming - Mesghinna	5/7/81	no	4847-introduced 4849-denied	Package of deposition exhibits from 1st Deposition of Dr. Mesghinna.
PLS EXHIBIT WRIR FM-200	State of Wyoming - Mesghinna	5/7/81	yes	4853-introduced 4872-admitted	Soil Log Profiles, comprising data used by Dr. Mesghinna.
PLS EXHIBIT WRIR FM-201	State of Wyoming - Mesghinna	5/7/81	yes	4853-introduced 4872-admitted	Pump Station Numbers. Data used by Dr. Mesghinna.
PLS EXHIBIT WRIR FM-202	State of Wyoming - Mesghinna	5/7/81	yes	4853-introduced 4872-admitted	Pump Station Summary. Data used by Dr. Mesghinna.
PLS EXHIBIT WRIR FM-203	State of Wyoming - Mesghinna	5/7/81	yes	4854-introduced 4872-admitted	Canal "Ridge" Data used by Dr. Meghinna to determine maximum Q data.
PLS EXHIBIT WRIR FM-204	State of Wyoming - Mesghinna	5/7/81	yes	4854-introduced 4872-admitted	Canal Hydraulic Properties used by Dr. Mesghinna in his analysis.
PLS EXHIBIT WRIR FM-205	State of Wyoming - Mesghinna	5/7/81	no	4854-introduced 4857-withdrawn	Private trust historic lands data.
PLS EXHIBIT WRIR FM-206	State of Wyoming - Mesghinna	5/7/81	no	4855-introduced 4857-withdrawn	Historic land acreages.
PLS EXHIBIT WRIR FM-207	State of Wyoming - Mesghinna	5/7/81	yes	4855-introduced 4872-admitted	Pipe Ratio Ranges used by Dr. Mesghinna.
PLS EXHIBIT WRIR FM-208	State of Wyoming - Mesghinna	5/7/81	yes	4856-introduced 4872-admitted	Cost estimates for open drains and outlet ditches by unit. Used by Dr. Mesghinna.
PLS EXHIBIT WRIR FM-209	State of Wyoming - Mesghinna	5/7/81	yes	4856-introduced 4872-admitted	Cost estimates for open drains and outlet ditches. Used by Dr. Mesghinna.
PLS EXHIBIT WRIR FM-210	State of Wyoming - Mesghinna	5/7/81	yes	4856-introduced 4872-admitted	Length of each size of drain lines used by unit. Data used by Dr. Mesghinna.

PLS EXHIBIT WRIR FM-300	State of Wyoming - Mesghinna	5/7/81	yes	4858-introduced 4872-admitted	Layout of pipelines with respect to the field and pump stations. Used by Dr. Mesghinna.
PLS EXHIBIT WRIR FM-301	State of Wyoming - Mesghinna	5/7/81	no	4858-introduced 4859-withdrawn	Exhibit of C values found in certain handbooks.
PLS EXHIBIT WRIR FM-400	State of Wyoming - Mesghinna	5/7/81	yes	4859-introduced 4872-admitted	Pipe costs for each unit. Used by Dr. Mesghinna.
PLS EXHIBITS WRIR FM-401 through FM-407	State of Wyoming - Mesghinna	5/7/81	yes	4860-introduced 4872-admitted	Annotated copies of maps of future lands study area showing pumping plant numbers.
PLS EXHIBIT WRIR FM-500	State of Wyoming - Mesghinna	5/7/81	no	4861-introduced 4862-withdrawn	Copy of information compiled by Mr. Sostrom from telephone conversation with Dr. Mesghinna.
PLS EXHIBITS WRIR FM-600 through FM-604	State of Wyoming - Mesghinna	5/7/81	yes	4864-introduced 4872-admitted	Five future projects by acre and field.
U.S. EXHIBIT WRIRC-265	United States - Mesghinna	5/7/81	yes	4878-introduced 4885-admitted	Wind River Indian Reservation land classification for Township 2 North, Range 5 East.
U.S. EXHIBIT WRIRC-264	United States - Mesghinna	5/7/81	yes	4878-introduced 4885-admitted	Wind River Indian Reservation land classification for Township 2 North, Range 6 East.
U.S. EXHIBIT WRIRC-266	United States - Dornbusch	5/7/81	yes	4907-introduced 5053-admitted	Resume of David M. Dornbusch.
U.S. EXHIBIT WRIRC-267	United States - Dornbusch	5/7/81	yes	4938-introduced 5053-admitted	Economic feasibility analysis process - irrigated agriculture - WRIR, Wyoming. Schematic illustration.
U.S. EXHIBIT WRIRC-268	United States - Dornbusch	5/7/81	yes	4841-introduced 5053-admitted	Dornbusch report - Economic Feasibility of Irrigated Agriculture Development. Description of Exhibit C-267 flow diagram.
U.S. EXHIBITS WRIRC-269 through C-273	United States - Dornbusch	5/7-8/81	yes	4951 through 5010-introduced 5053-admitted	Schematic illustrations of different segments of economic feasibility analysis process.
U.S. EXHIBIT WRIRC-274	United States - Dornbusch	5/11/81	yes	5102-introduced 5102-admitted	Graph showing varying discount rates and their effect on benefit-cost ratio for future projects.
PLS EXHIBITS WRIR ED-12, ED-13, ED-14	State of Wyoming - Dornbusch	5/11/81	yes	5103-introduced 5114-admitted	Table of crop budgets for project areas and tables 2, 3, 4 and 5 for 5%, 6% and 7-1/8% discount rate.

U.S. EXHIBIT WRIRC-275	United States - Dornbusch	5/11/81	yes	5115-introduced 5116-admitted	The Choice of a Discount Range for Evaluating Water Resource Projects - Dornbusch research paper.
PLS EXHIBIT WRIR ED-7	State of Wyoming - Dornbusch	5/11/81	yes	5129-introduced 6275-admitted	Reference Handbook for January 1980. Published by U.S. Water Resources Council.
PLS EXHIBIT WRIR ED-101	State of Wyoming - Dornbusch	5/11/81	yes	5199-introduced 5199-admitted	Diagram drawn by Dornbusch during testimony to explain discount rate and discounting to present value.
U.S. EXHIBIT WRIRC-276	United States - Stetson	5/12/81	not offered	5224-introduced	Historic lands map - Stetson. Shows project and non-project boundaries of lands receiving water.
PLS EXHIBIT WRIR HS-1	State of Wyoming - Stetson	5/12/81	yes	5279-introduced 5567-admitted	Stetson's Adjudicated Lands By Location on the Wind River Indian Reservation. By river system.
PLS EXHIBIT WRIR HS-2	State of Wyoming - Stetson	5/12/81	yes	5290-introduced 5567-admitted	Set of 14 worksheets used by Stetson to prepare consumptive use requirements.
PLS EXHIBIT WRIR HS-6	State of Wyoming - Stetson	5/12/81	yes	5290-introduced 5567-admitted	Set of 6 worksheets used by Stetson to determine Type VII net consumptive use.
PLS EXHIBITS WRIR HS-3, HS-4, HS-5	State of Wyoming - Stetson	5/12/81	yes	5290 through 5294-introduced 5567-admitted	Copy of tabulations for adjudicated, unadjudicated and Type VII lands, intended to show variance in evidence.
PLS EXHIBIT WRIR HS-7	State of Wyoming - Stetson	5/12/81	yes	5295-introduced 5567-admitted	Cropping data by climatic zone from Mesghinna used by Stetson for net irrigation requirement calculations.
PLS EXHIBIT WRIR HS-8	State of Wyoming - Stetson	5/12/81	yes	5301-introduced 5567-admitted	Net irrigation requirement for each crop within each climatic zone by cropping pattern.
PLS EXHIBIT WRIR HS-9	State of Wyoming - Stetson	5/12/81	yes	5325-introduced 5567-admitted	Compilation of Bureau of Reclamation and BIA records used by Stetson for acre-feet/acre water duty figures for FIPs.
PLS EXHIBIT WRIR HS-10	State of Wyoming - Stetson	5/12/81	yes	5327-introduced 5567-admitted	Table showing historic average annual irrigated acreage for Federal Irrigation Projects.
PLS EXHIBIT WRIR HS-11	State of Wyoming - Stetson	5/12/81	yes	5342-introduced 5567-admitted	Tabulations of Wapies used by Stetson to identify Type VII parcels. Supplements HS-3, HS-4 and HS-5.
PLS EXHIBIT WRIR GC-92	State of Wyoming - Stetson	5/13/81	yes	5401-introduced 5567-admitted	Certified copy of Proof No. 14032 for Permit No. 11707. Used in cross-examination of Stetson.
PLS EXHIBIT WRIR HS-13	State of Wyoming - Stetson	5/14/81	yes	5484-introdueed 5567-admitted	Set of work maps from Stetson of historic land, showing diversion and conveyance facilities.

PLS EXHIBIT WRIR HS-12	State of Wyoming - Stetson	5/14/81	yes	5495-introduced 5567-admitted	Coat estimates for Type VII lands. Work papers of Stetson.
PLS EXHIBIT WRIR HS-14	State of Wyoming - Stetson	5/14/81	yes	5498-introduced 5567-admitted	Blue line work map, for identification of Type VII lands. Used by Stetson.
PLS EXHIBIT WRIR HS-14A	State of Wyoming - Stetson	5/14/81	yes	5503-introduced 5567-admitted	Annotated blue line maps for identification of Type VII lands. Used by Stetson and annotated in red and blue to show canals. Type VIII lands shown in orange.
PLS EXHIBIT WRIR HS-14B	State of Wyoming - Stetson	5/14/81	yes	5565-introduced 5567-admitted	Copy of blue line maps for identification of Type VII lands. By stipulation of counsel, this copy will be made and submitted to replace HS-14 and HS-14A.
PLS EXHIBIT WRIR HS-15	State of Wyoming - Stetson	5/14/81	yes	5519 and 5524-introduced 5567-admitted	Work papers of Stetson showing unit value of various irrigation system costs.
U.S. EXHIBIT WRIRC-277	United States - Mesghinna	5/14/81	yes	5601-introduced 5702-admitted	Report of Dr. Mesghinna on Type VIII lands and Arapahoe Ranch.
PLS EXHIBIT WRIR FM-8A-52	State of Wyoming - Mesghinna	5/15/81	yes	5621-introduced 5699-admitted	Blue line copy of Plate 11 - Arapahoe Ranch - Dr. Mesghinna's work maps.
PLS EXHIBIT WRIR FM-8A-209	State of Wyoming - Mesghinna	5/15/81	not offered	5625-introduced	Blue line copy of Plate 13 - Sub Agency and Left Hand units - Dr. Mesghinna's work maps for Type VIII lands.
PLS EXHIBITS WRIR FM-8A-11 through 8A-15	State of Wyoming - Mesghinna	5/15/81	yes	5634 through 5636-introduced 5699-admitted	Blue line copies of maps of future projects depicting field numbers from work sheets.
PLS EXHIBITS WRIR FM-8A-100 through 8A-105	State of Wyoming - Mesghinna	5/15/81	yes	5643 through 5659-introduced 5699-admitted	Tabulations from Dr. Mesghinna's work papers for acreage, laterals, pipe lengths, pipe distribution network and pumping plant calculations.
PLS EXHIBIT WRIR FM-8A-200	State of Wyoming - Mesghinna	5/15/81	not offered	5673-introduced	Bureau of Reclamation Hole Log for area in South Crowheart. Unit Hole D9.
PLS EXHIBITS WRIR FM-8A-106 through 8A-117	State of Wyoming - Mesghinna	5/15/81	yes	5694 through 5698-introduced 5699-admitted	Dr. Mesghinna's work papers and system costs for Arapahoe Ranch, Arapahoe Unit, Ray Unit, Sub Agency Unit, Upper Wind Unit, Johnstown Unit and Coolidge Unit.
PLS EXHIBIT WRIR FM-8A-118	State of Wyoming - Mesghinna	5/15/81	yes	5698-introduced 5699-admitted	Dr. Mesghinna's Acreage Summary of Type VIII lands.
U.S. EXHIBIT WRIRC-278	United States - Dornbusch	5/19/81	yes	5719-introduced 5772-admitted	Dornbusch Report, Economic Feasibility Analysis for Irrigated Agriculture - Historic Type VII and VIII Lands.

PLS EXHIBIT WRIR ED-278A	State of Wyoming - Dornbusch	5/19/81	yes	5770-introduced 6275-admitted	Copy of Dornbusch Report served on State by United States on Friday, May 15th.
PLS EXHIBIT WRIR ED-100	State of Wyoming - Dornbusch	5/19/81	yes	5778-introduced 6275-admitted	Graph of "Alleged Benefit/Cost Ratio of US Future Irrigation Projects." Taken from Exhibits ED-12, ED-13, ED-14 and U.S. Exhibit C-268.
PLS EXHIBIT WRIR ED-8	State of Wyoming - Dornbusch	5/19/81	yes	5793-introduced 6275-admitted	Costs of producing crops, Riverton Area, Fremont County, Wyoming, 1977. Doug Agee's Report.
PLS EXHIBIT WRIR ED-30	State of Wyoming - Dornbusch	5/19/81	yes	5799-introduced 6275-admitted	Wyoming Crop and Livestock Reporting Service, May 1981 Report for barley estimates.
PLS EXHIBIT WRIR ED-29	State of Wyoming - Dornbusch	5/19/81	yes	5810-introduced 6275-admitted	1980 Wyoming Agricultural Statistics, Wyoming Crop and Livestock Reporting Service, page 90, on petroleum prices.
PLS EXHIBIT WRIR ED-16	State of Wyoming - Dornbusch	5/19/81	yes	5826-introduced 6275-admitted	Hand written notes from Dornbusch interviews of farmers.
PLS EXHIBIT WRIR ED-17	State of Wyoming - Dornbusch	5/19/81	yes	5839-introduced 6275-admitted	Pages of Plan for Completion of Wind River Irrigation Project of the Bureau of Indian Affairs. June 1968.
PLS EXHIBIT WRIR ED-15	State of Wyoming - Dornbusch	5/19/81	yes	5846-introduced 6275-admitted	Revised copy of "Criteria for Selection of Private Study Areas." HKM Report, 1978, with cover letter.
PLS EXHIBIT WRIR ED-51	State of Wyoming - Dornbusch	5/20/81	yes	5910-introduced 6275-admitted	Table published by USBIA showing unemployment rates for Wind River Indian Reservation.
PLS EXHIBIT WRIR ED-6	State of Wyoming - Dornbusch	5/20/81	yes	5911-introduced 6275-admitted	Copy of Federal Register, Friday, December 14, 1979, Part IX, Water Resources Council evaluation procedures.
PLS EXHIBIT WRIR ED-52	State of Wyoming - Dornbusch	5/20/81	yes	5942-introduced 6275-admitted	Series of notes taken by Dornbusch from interviews regarding employment of unemployed Indians.
PLS EXHIBIT WRIR ED-3	State of Wyoming - Dornbusch	5/20/81	yes	5982-introduced 6275-admitted	Federal Register, Monday, September 29, 1980, Part II, Water Resources Council principles and standards.
PLS EXHIBIT WRIR ED-53	State of Wyoming - Dornbusch	5/20/81	yes	6001-introduced 6275-admitted	Diagram drawn by Dornbusch durng testimony to illustrate regional economic development accounts.
PLS EXHIBIT WRIR ED-10	State of Wyoming - Dornbusch	5/20/81	yes	6054-introduced 6275-admitted	News release of US Water Resources Council. Sets discount rate at 7 1/8%.
PLS EXHIBIT WRIR ED-11	State of Wyoming - Dornbusch	5/20/81	no	6057-introduced 6104-withdrawn	Excerpt of Federal Register publication, published Upper Colorado Commission, October 17, 1980.

PLS EXHIBIT WRIR ED-26	State of Wyoming - Dornbusch	5/20/81	yes	6076-introduced 6275-admitted	National Resource Economics, Issues, Analysis, and Policy. Article by Charles W. Howe, regarding discount rate.
PLS EXHIBIT WRIR ED-25	State of Wyoming - Dornbusch	5/20/81	yes	6077-introduced 6275-admitted	Benefit/Cost Analysis for Water System Planning. Charles W. Howe, 1979.
PLS EXHIBIT WRIR ED-21	State of Wyoming - Dornbusch	5/20/81	yes	6079-introduced 6275-admitted	U.S. Water Resources Council - Options for the discount (interest) rate. November 1975.
PLS EXHIBIT WRIR ED-11A	State of Wyoming - Dornbusch	5/21/81	yes	6104-introduced 6275-admitted	Excerpt from Federal Register of October 22, 1980 regarding discount rate.
PLS EXHIBIT WRIR ED-54	State of Wyoming - Dornbusch	5/21/81	yes	6120-introduced 6275-admitted	Investment cost comparisons from Stetson Engineering - Type VIII lands.
PLS EXHIBIT WRIR ED-55	State of Wyoming - Dornbusch	5/21/81	yes	6130-introduced 6275-admitted	Construction cost schedules used by Dornbusch for future project areas.
PLS EXHIBIT WRIR ED-56	State of Wyoming - Dornbusch	5/21/81	yes	6153-Introduced 6275-admitted	Dornbusch notes on labor costs for operation, maintenance and repair on future projects.
PLS EXHIBIT WRIR ED-22	State of Wyoming - Dornbusch	5/21/81	yes	6207-introduced 6275-admitted	Primer for Policy Analysis, Stokey and Zeckhauser.
PLS EXHIBIT WRIR ED-28	State of Wyoming - Dornbusch	5/21/81	yes	6209-introduced 6275-admitted	Book excerpt: Public Investment: The Rate of Return.
PLS EXHIBIT WRIR ED-24	State of Wyoming - Dornbusch	5/21/81	yes	6229-introduced 6275-admitted	Wall Street Journal of November 13, 1980 - McCraken article on Economic Policies.
PLS EXHIBIT WRIR ED-23	State of Wyoming - Dornbusch	5/21/81	yes	6231-introduced 6275-admitted	Fortune Magazine excerpt - "The Tax Strategy to Renew the Economy".
U.S. EXHIBIT WRIRC-279	United States - Vogel	6/2/81	yes	6329-Introduced 6335-admitted	Resume of David A. Vogel.
U.S. EXHIBIT WRIRC-280	United States - Vogel	6/2/81	yes	6337-introduced 6553-admitted	Vogel report - Instream flow recommendations for fishery resources in the major rivers and streams on WRIR.
U.S. EXHIBIT WRIRC-281	United States - Vogel	6/2/81	yes	6361-introduced 6553-admitted	Instream flow claims for fisheries - WRIR. Map of Vogel recommendations illustrating stream reaches.
U.S. EXHIBIT WRIRC-282	United States - Vogel	6/2/81	yes	6377-introduced 6553-admitted	Example - top use schematic of study site. Page 16 of Report.
U.S. EXHIBIT WRIRC-283	United States - Vogel	6/2/81	yes	6378-introduced 6553-admitted	Cross-sectional profile of a hypothetical transect. Page 17 of Report.

U.S. EXHIBIT WRIRC-284	United States - Vogel	6/2/81	yes	6447-introduced 6558-admitted	Graph of WUA versua flow for rainbow trout on reach between Bull Lake Creek and Diversion Dam .
U.S. EXHIBIT WRIRC-285	United States - Vogel	6/3/81	yes	6512-introduced 6553-admitted	Hand sketched outline of Vogel's testimony.
U.S. EXHIBIT WRIRC-286	United States - Vogel	6/3/81	yes	6555-introduced 6555-admitted	Schematic drawn by Vogel illustrating computer program used by him in analysis.
PLS EXHIBIT WRIRC-FISH-1	State of Wyoming - Vogel	6/3/81	yes	6588-introduced 6895-admitted	Slide presentation of Fish and and Wildlife Service of Instream Flow Group's incremental approach.
PLS EXHIBIT WRIRC-FISH-1A	State of Wyoming - Vogel	6/3/81	yes	6593-introduced 6895-admitted	Guide to slide presentation of FISH-1.
PLS EXHIBIT WRIRC-FISH-2	State of Wyoming - Vogel	6/3/81	yes	6608-introduced 6895-admitted	Page 22 of Principles of Fishery Science. Everhart and Young.
PLS EXHIBITS WRIRC-FISH-200 through 202	State of Wyoming - Vogel	6/3/81	yes	6644-introduced 6895-admitted	Summarized results of Vogel Creel Surveys - 1978 through 1980.
PLS EXHIBIT WRIRC-FISH-30	State of Wyoming - Vogel	6/4/81	not offered	6702-introduced	Computer program listing of IFG 2 and IFG 4 programs.
PLS EXHIBIT WRIRC-FISH-31	State of Wyoming - Vogel	6/4/81	yes	6717-introduced 6895-admitted	Handwritten notes from Vogel's files regarding computer commands.
PLS EXHIBIT WRIRC-FISH-32	State of Wyoming - Vogel	6/4/81	yes	6717-introduced 6895-admitted	PROCFIL: A User's Guide for Utilizing PHABSIM Program.
PLS EXHIBIT WRIRC-FISH-45	State of Wyoming - Vogel	6/4/81	yes	6719-introduced 6895-admitted	Illustration of Slide 45 from IFG Slide Show, FISH-1.
PLS EXHIBIT WRIRC-FISH-4	State of Wyoming - Vogel	6/4/81	yes	6742-introduced 6895-admitted	Probsbility of Use Criteria for the Family Salmonide. Instream Flow Information Paper No. 4, January 1978.
PLS EXHIBIT WRIRC-FISH-M1A	State of Wyoming - Vogel	6/4/81	yes	6756-introduced 6895-admitted	Overlay for Tribes Exhibit M1, illustrating claim reaches, numbers and study stretches on U.S. Exhibit C-281.
PLS EXHIBIT WRIRC-FISH-284	State of Wyoming - Vogel	6/4/81	yes	6779-introduced 6895-admitted	Extension of graph of U.S. Exhibit 284, extending right side of graph to completion of graphs.
PLS EXHIBIT WRIRC-FISH-50	State of Wyoming - Vogel	6/4/81	yes	6793-introduced 6895-admitted	Pages 78 and 79 of Vogel Report, U.S. Exhibit C-280.

PLS EXHIBIT WRIRC-FISH-280-77A1	State of Wyoming - Vogel	6/4/81	yea	6802-introduced 6895-admitted	Pages 204 and 205, Compilation of Records of Surface Waters of the United States. Part 6-A: Missouri River Basin above Sioux City, Iowa. 1950-1960.
PLS EXHIBIT WRIRC-FISH-103E	State of Wyoming - Vogel	6/4/81	yes	6835-introduced 6895-admitted	Computer output of flow versus WUA for Brown and Rainbow Trout on Reach No. 1.
PLS EXHIBIT WRIRC-FISH-280-24e	State of Wyoming - Vogel	6/4/81	yes	6838-introduced 6895-admitted	Copy of figure 7 from Vogel Report, U.S. Exhibit C-280, Page 24.
PLS EXHIBITS WRIRC-FISH-103A, FISH-103C1 through 103C3, 103D, 103F	State of Wyoming - Vogel	6/5/81	yes	6848 through 6895-introduced 6895-admitted	Vogel field notes for Reach No. 1, for various dates, original coding sheet for field data, and computer listing.
PLS EXHIBITS WRIRC-FISH-104A, 104C1, 104C2, 104D, 104E, 104F	State of Wyoming - Vogel	6/5/81	yes	6850 through 6851-introduced 6895-admitted	Vogel field notes for Reach No. 2, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-105A, 105C1, 105C2, 105C3, 105D, 105E, 105F	State of Wyoming - Vogel	6/5/81	yes	6851-introduced 6895-admitted	Vogel field notes for Reach No. 3, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-109A, 109C1, 109C2, 109C3, 109D, 109E, 109F	State of Wyoming - Vogel	6/5/81	yes	6855-introduced 6895-admitted	Vogel field notes for Reach No. 6, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-110A, 110C, 110D, 110E, 110F	State of Wyoming - Vogel	6/5/81	yes	6856-introduced 6895-admitted	Vogel field notes for Reach No. 7, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-111C1, 111C2, 111C3, 111D, 111E, 111F	State of Wyoming - Vogel	6/5/81	yes	6857-introduced 6895-admitted	Vogel field notes for Reach No. 9, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-112A, 112C, 112D, 112E, 112F	State of Wyoming - Vogel	6/5/81	yes	6857-introduced 6895-admitted	Vogel field notes for Reach No. 8, for various dates, original coding sheet for field data, computer output and computer data file.

PLS EXHIBITS WRIRC-FISH-113A, 113C, 113D, 113E, 113F	State of Wyoming - Vogel	6/5/81	yes	6859-introduced 6895-admitted	Vogel field notes for Reach No. 10, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH- 114A1, 114A2, 114C, 114D, 114E, 114F	State of Wyoming - Vogel	6/5/81	yes	6859-introduced 6895-admitted	Vogel field notes for Reach No. 11, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-115A, 115C, 115D, 115E, 115F	State of Wyoming - Vogel	6/5/81	yes	6860-introduced 6895-admitted	Vogel field notes for Reach No. 12, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-116A, 116C, 116D, 116E, 116F	State of Wyoming - Vogel	6/5/81	yes	6860-introduced 6895-admitted	Vogel field notes for Reach No. 14, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-117A, 117C, 117D, 117E, 117F	State of Wyoming - Vogel	6/5/81	yes	6861-introduced 6895-admitted	Vogel field notes for Reach No. 13, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-118A, 118C, 118D, 118E, 118F	State of Wyoming - Vogel	6/5/81	yes	6862-introduced 6895-admitted	Vogel field notes for Reach No. 15, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBITS WRIRC-FISH-119A, 119C, 119D, 119E, 119F	State of Wyoming - Vogel	6/5/81	yes	6863-introduced 6895-admitted	Vogel field notes for Reach No. 16, for various dates, original coding sheet for field data, computer output and computer data file.
PLS EXHIBIT WRIRC-FISH-120	State of Wyoming - Vogel	6/5/81	yes	6863-introduced 6895-admitted	Substrate coding used in in-stream flow calculations.
PLS EXHIBITS WRIRC-FISH-131 through 135	State of Wyoming - Vogel	6/5/81	yes	6864 through 6866-introduced 6895-admitted	Vogel field notes for Reaches 4 and 5, for various dates, including computer graphs and coding forms.
PLS EXHIBIT WRIRC-FISH-140	State of Wyoming - Vogel	6/5/81	yes	6873-introduced 6895-admitted	List of curves by reach and page number from U.S. Exhibit C-280 in which the State could find no data in support thereof.

PLS EXHIBIT WRIRC-FISH-2A	State of Wyoming - Vogel	6/5/81	yes	6890-introduced 6895-admitted	Full text of Principles of Fishery Science, from which FISH-2 was taken.
PLS EXHIBIT WRIRC-FISH-280-77A2	State of Wyoming - Vogel	6/5/81	yes	6895-introduced 6895-admitted	Page 204 of Compilation of Records of Surface Waters of the United States. Part 6-A: Missouri River Basin above Sioux City, Iowa. 1950-1960.
U.S. EXHIBIT WRIRC-287	United States - Toedter	6/15/81	yes	6912-introduced 7004-admitted	Typical depletion study - Water Budget. Toedter diagram to illustrate depletion analysis.
U.S. EXHIBIT WRIRC-288	United States - Toedter	6/15/81	yes	6914-introduced 7004-admitted	Depletion study area map in natural flow analysis. Wind River Basin - Toedter.
U.S. EXHIBIT WRIRC-289	United States - Toedter	6/15/81	yes	6918-introduced 7004-admitted	Wind River agricultural depletion flow chart.
U.S. EXHIBIT WRIRC-295-1 through C-295-31	United States - Toedter	6/15/81	yes	6943-introduced 7004-admitted	Thirty-one hydrographic photos showing historic irrigation depletion. Toedter supplement to Billstein hydrographs.
U.S. EXHIBIT WRIRC-293	United States - Toedter	6/15/81	yes	6984-introduced 7004-admitted	Copy of computer printout results of depletion analysis. 1918-1979 facts and data.
U.S. EXHIBIT WRIRC-294	United States - Toedter	6/15/81	not admitted	7005-introduced 7007-not admitted (See also 7245)	Systems operations study map showing return flow areas. (not admitted on 6/15/81 due to violation of 5-day rule)
U.S. EXHIBIT WRIRC-296	United States - Keene	6/16/81	yes	7056-introduced 7157-admitted	Natural flow study groups. Outline of testimony, Keene.
U.S. EXHIBIT WRIRC-297	United States - Keene	6/16/81	yes	7057-introduced 7157-admitted	Stream gauge map - Wind River Basin, with index of USGS and BIA gauge sites.
U.S. EXHIBIT WRIRC-298	United States - Keene	6/16/81	yes	7061-introduced 7157-admitted	Map of Group B study sites with index of site locations.
U.S. EXHIBITS WRIRC-299 and C-300	United States - Keene	6/16/81	yes	7089 and 7092-introduced 7157-admitted	Surface water flow charts - natural and historic flows - Wind River Basin.
U.S. EXHIBIT WRIRC-301	United States - Keene	6/16/81	yes	7110-introduced 7201-admitted	Natural flow study. Report of Keene findings and conclusions.
U.S. EXHIBIT WRIRC-302	United States - Keene	6/16/81	yes	7126-introduced 7201-admitted	Supplement to Keene Report showing monthly stream flows for study period of Group A sites and B-2 sites.

PLS EXHIBIT WRIR NK-2	State of Wyoming - Keene	6/18/81	yes	7165-introduced 7201-admitted	Work paper bar graph of Keene showing annual deviations from mean for Bull Lake near Lenore.
PLS EXHIBIT WRIR NK-3	State of Wyoming - Keene	6/18/81	yes	7186-introduced 7201-admitted	Monthly distribution flow values for B-1 sites. Work paper of Keene.
PLS EXHIBIT WRIR NK-4	State of Wyoming - Keene	6/18/81	yes	7186-introduced 7201-admitted	Monthly distribution flow values for site 16, North Fork, Sage Creek. Work paper of Keene.
PLS EXHIBIT WRIR NK-300A	State of Wyoming - Keene	6/18/81	yes	7191-introduced 7201-admitted	Blue line copy of U.S. Exhibit C-300 highlighting certain extreme reaches where gauge and depletion analysis were used.
PLS EXHIBIT WRIR NK-300B	State of Wyoming - Keene	6/18/81	yes	7192-introduced 7201-admitted	Blue line copy of U.S. Exhibit C-300 highlighting extreme reaches of NK-300A and indicating areas of return flow from existing irrigation.
U.S. EXHIBIT WRIRC-303-ADJ	United States - Echohawk	6/18/81	yes	7210-introduced 7213-admitted	Annotated maps of adjudicated lands, regarding Motion To Take Judicial Notice.
U.S. EXHIBIT WRIRC-304-ADJ	United States - Echohawk	6/18/81	yes	7210-introduced 7213-admitted	Summary documents of information contained in U.S. Motion To Take Judicial Notice, and references to C-303-ADJ.
U.S. EXHIBIT WRIRC-305	United States - Billstein	6/18/81	yes	7215-introduced 7427-admitted	Systems operations study map. Billstein
U.S. EXHIBIT WRIRC-306	United States - Billstein	6/18/81	yes	7240-introduced 7427-admitted	Water duty schedule (Historic).
U.S. EXHIBIT WRIRC-307 and C-308	United States - Billstein	6/18/81	yes	7273 and 7297-introduced 7427-admitted	Control point descriptions. Big Wind River and Little Wind Operation Studies. Billstein.
U.S. EXHIBIT WRIRC-309, C-310, C-311	United States - Billstein	6/19/81	yes	7396-introduced 7427-admitted	Billstein work paper: Summary table for Big Wind System, Little Wind System, Popo Agie, Little Wind below Popo Agie, and Bighorn Systems of review of recommended fishery flows from Vogel.
U.S. EXHIBIT WRIRC-312	United States - Billstein	6/19/81	yes	7404-introduced 7427-admitted	Computer printout of Little Wind River agriculture study run. Uses 45% efficiency factor for low flow years.
U.S. EXHIBIT WRIRC-313	United States - Billstein	6/19/81	yes	7404-introduced 7427-admitted	Computer printout of Big Wind River System study by node number with years of results for 1946-1979.
U.S. EXHIBIT WRIRC-314	United States - Billstein	6/19/81	yes	7404-introduced 7427-admitted	Computer printout of Popo Agie, Little Wind, and Bighorn. Popo Agie fish study by node, 1946-1979 by month.

U.S. EXHIBIT WRIRC-315	United States - Billstein	6/19/81	yes	7404-introduced 7428-admitted	Results of Little Wind Operational Study by node, 1946-1979 by month.
U.S. EXHIBIT WRIRC-316	United States - Billstein	6/19/81	yes	7428-introduced 7428-admitted	Control point descriptions. Billstein.
PLS EXHIBIT WRIR ED-22A	State of Wyoming - Dornbusch	6/19/81	yes	7433-introduced 7433-admitted	A Primer for Policy Analysis, Stokey and Zeckhauser. Entire text supplementing excerpts introduced as Pls. Ex. ED-22.
PLS EXHIBIT WRIR ED-25A	State of Wyoming - Dornbusch	6/19/81	yes	7433-introduced 7433-admitted	Benefit/Cost Analysis for Water System Planning, Howe. Entire text supplementing excerpt introduced as Pls. Ex. ED-25.
PLS EXHIBIT WRIR ED-26A	State of Wyoming - Dornbusch	6/19/81	yes	7433-introduced 7433-admitted	Natural Resource Economics, Charles W. Howe. Entire text supplementing excerpt introduced as Pls. Ex. ED-26.
PLS EXHIBIT WRIR ED-28A	State of Wyoming - Dornbusch	6/19/81	yes	7433-introduced 7433-admitted	Public Investment, the Rate of Return and Optimal Fiscal Policy, Arrow and Kurz. Entire text supplementing excerpt introduced as Plaintiff's Exhibit ED-28.
DEFENDANT HANOVER 1	Donnell - Billstein	6/19/81	yes	7444-introduced 7448-admitted	Big Wind River Operation Study Computer Printout. 6/15/81. Billstein.
DEFENDANT HANOVER 2	Donnell - Billstein	6/19/81	yes	7444-introduced 7448-admitted	Fishery Study Computer Printout. 6/16/81. Billstein.
DEFENDANT HANOVER 3	Donnell - Billstein	6/19/81	yes	7444-introduced 7448- admitted	Little Wind River Operation Study Computer Printout. 6/15/81. Billstein.
PLS EXHIBITS WRIR SB-3A and SB-3B	State of Wyoming - Billstein	7/9/81	yes	7631 -introduced 7663 -admitted	Pages 1, 2, 6, 7 and 8 from Defendant Hanover Exhibit 3.
PLS EXHIBIT WRIR SB-1	State of Wyoming - Billstein	7/9/81	not offered	7630-introduced 7663-not offered	Water Duty Schedule for Riverton East Futures Project. Billstein. Same as Page 31 of U.S. Exhibit C-245.
PLS EXHIBIT WRIR SB-2	State of Wyoming - Billstein	7/9/81	yes	7642-introduced 7663-admitted	Memorandum to Billstein from Elwell regarding Wind River Seepage Estimates.
U.S. EXHIBIT WRIRC-294	United States - Billstein	7/9/81	yes	7689-introduced 7737-admitted	Systems Operations Study Map. Billstein. Shows return flow areas.
PLS EXHIBIT WRIR RFT-1	State of Wyoming - Billstein	7/9/81	yes	7697-introduced 7737-admitted	Return Flow Formula given to Billstein by Toedter.
PLS EXHIBIT WRIR GS-4	State of Wyoming - Christopolus	7/16/81	not offered	7770-introduced	Copy of United States Amended Motion to Take Judicial Notice.

PLS EXHIBIT WRIR SS-3	State of Wyoming - Christopolus	7/16/81	not offered	7774-introduced	Adjudicated acreage claim on trust lands. Taken from U.S. Exhibit WRIR-304ADJ.
PLS EXHIBIT WRIR GS-1	State of Wyoming - Christopolus	7/16/81	not offered	7777-introduced	Copy of U.S. Memorandum in Support of Motion to Take Judicial Notice and for Order re: prima facie evidence of irrigability.
U.S. EXHIBIT WRIRC-317	United States - Eckman	7/16/81	yes	7842-introduced 7858-admitted	Four boxes of data compiling the land index of Wind River Indian Reservation by Township and Range legal description.
U.S. EXHIBIT WRIRC-317A	United States - Eckman	7/16/81	yes	7842-introduced 7858-admitted	Single page from C-317 index. For illustration of information contained in C-317.
U.S. EXHIBIT WRIRC-318	United States - Eckman	7/16/81	yes	7862-introduced 7865-admitted	Documents from Buresu of Indian Affairs regarding land taken for Boysen Reservoir. Contained in United States Futures Claim for Riverton East.
U.S. EXHIBIT WRIRC-319	United States - Echohawk	7/16/81	yes	7868-introduced 7870-admitted	"Missouri Basin Project Ownership Map". Accompanying documents on Boysen Reservoir Land conveyance.
TRIBES EXHIBIT 4	The Tribes - Kolstad	7/17/81	yes	8007-introduced 8030-admitted	Tax Roll and Ledger Accounts from Fremont County Treasurer. Regards land on Reservation.
TRIBES EXHIBIT 5	The Tribes - Kolstad	7/17/81	yes	8008-introduced 8030-admitted	Deeds and other title documents of public record regarding land on reservation.
TRIBES EXHIBIT 7	The Tribes - Kolstad	7/17/81	yes	8013-introduced 8030-admitted	Map depicting fee lands own by Indians on Reservation.
TRIBES EXHIBIT 6	The Tribes - Kolstad	7/17/81	yes	8013-introduced 8030-admitted	Supplements Tribes Exhibit 7. Depicts tracts not capable of depiction on Exhibit 7.
TRIBES EXHIBIT 8	The Tribes - Higginson	7/27/81	yes	8055-introduced 8238-admitted	Report of Higginson - Indian Owned Fee Lands - Wind River Indian Reservation. June 26, 1981.
TRIBES EXHIBIT 9	The Tribes - Higginson	7/27/81	yes	8056-introduced 8238-admitted	Replacement pages to Exhibit 8 for typographical corrections.
TRIBES EXHIBITS 10-1 through 10-40	The Tribes - Higginson	7/27/81	yes	8060-introduced 8238-admitted	Group of 40 hydrographic aerial photographs used by Higginson. Copies taken from Billstein photos. Plots fee owned lands.
TRIBES EXHIBIT 11	The Tribes - Higginson	7/27/81	yes	8061-introduced 8238-admitted	List of Exhibit Numbers 10-1 through 10-40 and corresponding photograph number for each Exhibit.
PLS EXHIBIT WRIR KH-7	State of Wyoming - Higginson	7/27/81	yes	8154-introduced 8238-admitted	Portion of blue line copy of Bureau of Reclamation study maps for Township 1 North, Range 4 East, NE1/4, 1964.

PLS EXHIBIT WRIR KH-8	State of Wyoming - Higginson	7/27/81	yes	8160-introduced 8238-admitted	A blue line print of U.S. Exhibit C-148-I2.
PLS EXHIBIT WRIR KH-9	State of Wyoming - Higginson	7/27/81	yes	8165-introduced 8238-admitted	A blue line print of U.S. Exhibit C-148-13.
PLS EXHIBIT WRIR KH-11	State of Wyoming - Higginson	7/27/81	yes	8166-introduced 8238-admitted	Pages 5 through 7 of HKM's Historic Lands Study. Land classification standards.
PLS EXHIBIT WRIR KH-5	State of Wyoming - Higginson	7/27/81	yes	8184-introduced 8238-admitted	Copy of HKM's "Criteria for Selection of Project Study Areas" and cover letter.
PLS EXHIBIT WRIR KH-6	State of Wyoming - Higginson	7/27/81	yes	8185-introduced 8238-admitted	Excerpt from BIA "Plan for Completion of Wind River Irrigation Project." Same as Plaintiff's Exhibit ED-17.
PLS EXHIBIT WRIR KH-3	State of Wyoming - Higginson	7/27/81	yes	8214-introduced 8238-admitted	May 1980 Department of Interior, Water and Power Resources Service, Instructions. Series 110 Planning, Part 115.
PLS EXHIBIT WRIR KH-10	State of Wyoming - Higginson	7/27/81	yes	8219-introduced 8238-admitted	Excerpt from soil survey of Riverton area, Wyoming, SCS December 1974.
PLS EXHIBIT WRIR KH-12	State of Wyoming - Higginson	7/27/81	yes	8236-introduced 8238-admitted	Copies of Interview Information Sheets of interview notes of Indian fee land owners.
U.S. EXHIBIT WRIRC-317-1	United States - Echohawk	7/28/81	yes	8247-introduced 8248-admitted	Update of land index of Wind River Indian Reservation, for U.S. Exhibit 317. Range East.
U.S. EXHIBIT WRIRC-317-2	United States - Echohawk	7/28/81	yes	8247-introduced 8248-admitted	Update of land index of Wind River Indian Reservation, for U.S. Exhibit 317. Range West.
TRIBES EXHIBIT 12	The Tribes - Bliesner	7/28/81	yes	8256-introduced 8260-admitted	Resume of Ronald Bliesner.
TRIBES EXHIBIT 13	The Tribes - Bliesner	7/28/81	yes	8272-introduced 8726-admitted	Irrigation System Design and Engineering Review of the Conceptual Irrigation Development Plan for the Wind River Indian Reservation. Report of Ron Bliesner.
TRIBES EXHIBIT 14	The Tribes - Bliesner	7/28/81	yes	8275-introduced 8561-admitted	Estimates of the Effect on Stream Flow from Irrigation of Additional Trust Lands on Big Horn Flats and Stagner Ridge. Wind River Indian Reservation. Keller Engineers.
TRIBES EXHIBITS 13-1 and 13-2	The Tribes - Bliesner	7/28/81	yes	8278-introduced 8561-admitted	Proposed Irrigation Project - Big Horn Flats Unit. Sheets 1 and 2.
TRIBES EXHIBIT 15	The Tribes - Bliesner	7/28/81	yes	8279-introduced 8563-admitted	Composite Map of Exhibits 13-1 and 13-2.

TRIBES EXHIBIT 16	The Tribes - Bliesner	7/28/81	yes	8563-admitted	Large scale drawing of figure 2, page 10, Tribes Exhibit 13.
TRIBES EXHIBIT 17	The Tribes - Bliesner	7/28/81	yes	8308-introduced 8563-admitted	Center pivot operation simulation.
TRIBES EXHIBITS 13-4 through 13-10	The Tribes - Bliesner	7/28/81	yes	8328-introduced 8727-admitted	Proposed irrigation drainage plans for future projects proposed by Keller Engineers.
TRIBES EXHIBIT 13-3	The Tribes - Bliesner	7/28/81	yes	8342-introduced 8561-admitted	Conceptual Irregation Development Plan for Stagner Ridge Unit.
TRIBES EXHIBIT 18	The Tribes - Bliesner	7/28/81	yes	8343-introduced 8563-admitted	Enlarged view of recoverable return flow equation found on page 2 of Tribes Exhibit 14.
PLS EXHIBIT WRIR RB-11	State of Wyoming - Bliesner	7/29/81	not offered	8495-introduced 8564-not offered	Results of center pivot operations simulation model - Big Horn Flats. Three pages of handwritten notes.
PLS EXHIBIT WRIR RB-10	State of Wyoming - Bliesner	7/29/81	not offered	8496-introduced 8564-not offered	Plot of data from six tests conducted on intake rate.
PLS EXHIBIT WRIR RB-12	State of Wyoming - Bliesner	7/29/81	not offered	8512-introduced 8564-not offered	Two tables: summarizing Stetson design costs less on-farm costs and Big Horn Flats/Stagner Ridge design costs.
PLS EXHIBIT WRIR RB-1	State of Wyoming - Bliesner	7/29/81	not offered	8520-introduced 8564-not offered	Mainline specifications for Big Horn Flats. Computer printout tabulation.
PLS EXHIBIT WRIR RB-5	State of Wyoming - Bliesner	7/29/81	not offered	8522-introduced 8564-not offered	Sketch of system layout for redesign of Stetson design for North Crowheart.
PLS EXHIBITS WRIR RB-6, RB-7, RB-8	State of Wyoming - Bliesner	7/29/81	not offered	8526-introduced 8564-not offered	Sketch of system layout for redesign of Stetson design for North Crowheart Units 52, 53 and 53A, Riverton East No. 3, and North Crowheart Nos. 32-35.
PLS EXHIBIT WRIR RB-13	State of Wyoming - Bliesner	7/29/81	not offered	8526-introduced 8564-not offered	Computer output from mainline designs for redesign system covering Exhibits RB-4 through RB-8.
PLS EXHIBIT WRIR RB-2	State of Wyoming - Bliesner	7/29/81	not offered	8540-introduced 8564-not offered	Computer output for pumping plant costs for Big Horn Flats.
PLS EXHIBIT WRIR RB-3	State of Wyoming - Bliesner	7/29/81	not offered	8549-introduced 8564-not offered	Drainage pipe sizing procedure for Wind River Indian Reservation Irrigation Project.
PLS EXHIBIT WRIR RB-4	State of Wyoming - Bliesner	7/29/81	not offered	8551-introduced 8564-not offered	Costs projection for 12 inch drain. Wind River Indian Reservation Irrigation Project.

PLS EXHIBIT WRIR RB-14	State of Wyoming - Bliesner	7/29/81	not offered	8551-introduced 8564-not offered	Computer output for pumping plant costs for Stagner Ridge. North Crowheart Pumping Plant before and after addition of Stagner Ridge.
TRIBES EXHIBIT 19	The Tribes - Willardson	7/29/81	yes	8573-introduced 8574-admitted	Curriculum vita of Lyman Willardson.
TRIBES EXHIBITS 20, 21 and 22	The Tribes - Willardson	7/29/81	yes	8583-introduced 8592-admitted	Slides taken of Big Horn Flats area depicting sandstone overview and profile.
TRIBES EXHIBIT 23	The Tribes - Keller	7/30/81	yes	8760-introduced 8763-admitted	Resume of Dr. Jack Keller.
TRIBES EXHIBIT 24	The Tribes - Cummings	9/1/81	yes	8846-introduced 9039-admitted	"A Critical Review of Economic Criteria for Demonstrating Practicably Irrigable Acreage with Application to the Wind River Indian Reservation." Report of Dr. Cummings.
PLS EXHIBIT WRIR EC-1	State of Wyoming - Cummings	9/1/81	yes	8960-introduced 9039-admitted	Letter to Secretary of Interior dated July 28, 1904 from S. M. Brossius, Agent Indian Rights Association.
PLS EXHIBIT WRIR EC-2	State of Wyoming - Cummings	9/1/81	yes	8966-introduced 9039-admitted	Letter to State Engineer dated January 14, 1911 from Charles Lajeunesse.
PLS EXHIBIT WRIR EC-3	State of Wyoming - Cummings	9/1/81	yes	8966-introduced 9039-admitted	Letter to State Engineer dated January 16, 1911 from Charles Lajeunesse.
PLS EXHIBIT WRIR EC-4	State of Wyoming - Cummings	9/1/81	yes	8967-introduced 9039-admitted	Letter dated February 4, 1908 to State Engineer from H. E. Wadsworth.
TRIBES EXHIBIT OCS-1	The Tribes - Stewart	9/2/81	yes	9062-introduced 9063-admitted	Curriculum vitae of Dr. Omar Stewart.
TRIBES EXHIBIT OCS-1A	The Tribes - Stewart	9/2/81	yes	9066-introduced 9239-admitted	Fishing and the Wind River Shoshone Indians. Report of Dr. Stewart.
TRIBES EXHIBIT OCS-24	The Tribes - Stewart	9/2/81	yes	9080-introduced 9082-admitted	Select pages from Annals of Wyoming, State Archives, Volume 30, No. 1, April 1958. "Washakie and the Shoshone", Part X.
TRIBES EXHIBIT OCS-2	The Tribes - Stewart	9/2/81	yes	9094-introduced 9100-admitted	Typed copy of letter F-90 in National Archives.
TRIBES EXHIBIT OCS-3	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Handwritten report of October 23, 1872 from Felix Brunot regarding treaty negotiations.
TRIBES EXHIBIT OCS-4	The Tribes - Stewart	9/2/81	yes	9094-introduced 9112-admitted	1955 Wyoming Historical Handbook. Fish and Game.

TRIBES EXHIBIT OCS-5	The Tribes - Stewart	9/2/81	yes	9094-introduced 9118-admitted	Excerpt: Annals of Wyoming, Volume 26, No. 2, Part III, "Washakie and the Shoshone". July, 1954.
TRIBES EXHIBIT OCS-6	The Tribes - Stewart	9/2/81	yes	9094-introduced 9122-admitted	Excerpt: Annals of Wyoming, Volume 29, No. 2, "The Dukurika Indians". October, 1957.
TRIBES EXHIBIT OCS-7	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Annals of Wyoming, Vol. 25, No. 2, Part I, "Washakie and the Shoshone". July, 1953.
TRIBES EXHIBIT OCS-8	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Washakie: An account of Indian Resistance of Covered Wagon and Union Pacific Railroad Invasion of Their Territory.
TRIBES EXHIBIT OCS-9	The Tribes - Stewart	9/2/81	yes	9094-introduced 9130-admitted	Survey of Conditions of the Indians. 1929-44.
TRIBES EXHIBIT OCS-10	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Historical and Statistical Information, Respecting the History, Conditions and Prospects of the Indian Tribes of the United States. 1851.
TRIBES EXHIBIT OCS-12	The Tribes - Stewart	9/2/81	yes	9094-introduced 9144-admitted	Excerpt: Indian Peoples in Idaho, Omar Stewart.
TRIBES EXHIBIT OCS-12A	The Tribes - Stewart	9/2/81	yes	9094-introduced 9146-admitted	Excerpt: "Tribal Distribution in Eastern Oregon and Adjacent Regions". Verne Ray.
TRIBES EXHIBIT OCS-13	The Tribes - Stewart	9/2/81	yes	9094-introduced 9148-admitted	Excerpt: "The Ethnological Position of the Sheepeater Indians in Wyoming". Ake Hultkrantz.
TRIBES EXHIBIT OCS-14	The Tribes - Stewart	9/2/81	yes	9094-introduced 9148-admitted	Excerpt: "Haivodika: An Acculturated Shoshone Group in Wyoming". Ake Hultkrantz.
TRIBES EXHIBIT OCS-15	The Tribes - Stewart	9/2/81	yes	9094-introduced 9152-admitted	Excerpt: Dissertation - Some Interactions of Culture, Needs, and Personalities Among the Wind River Shoshone. Shimkin.
TRIBES EXHIBIT OCS-16	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Basin - Plateau Aboriginal Sociopolitical Groups. Steward.
TRIBES EXHIBIT OCS-17	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: "Shoshone - Bannock Subsistence and Society". Murphy. Anthropological Records, Vol. 16, No. 17. 1960.
TRIBES EXHIBIT OCS-18	The Tribes - Stewart	9/2/81	yes	9094-introduced 9157-admitted	Excerpt: Culture Element Distributions: XXIII Northern and Gosiute Shoshone. Steward.

TRIBES EXHIBIT OCS-19	The Tribes - Stewart	9/2/81	yes	9094-introduced 9159-admitted	Excerpt: "Notes on Shoshonean Ethnography:. Lowie. From Anthropological Papers of the American Museum of National History.
TRIBES EXHIBIT OCS-20	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: "Wind River Shoshone Ethnogeography". Shimkin. Anthropological Records, Vol. 5, No. 4. 1947
TRIBES EXHIBIT OCS-21	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: The Fur Hunters of the Far West. Alexander Ross.
TRIBES EXHIBIT OCS-22	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Volume I, 41st Session of Congress, 1870, Report of the Secretary of Interior to the Houses of Congress.
TRIBES EXHIBIT OCS-25	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Letter of October 4, 1868 to the President of the Indian Peace Commission. Reproduced in OCS-24.
TRIBES EXHIBIT OCS-26	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Annals of Wyoming, Vol. 33, No. 1, "The Shoshone in the Rocky Mountain Area". Ake Hultkranz.
TRIBES EXHIBIT OCS-27	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: "Tribal Divisions within the Eastern Shoshone of Wyoming". Abe Hultkrantz.
TRIBES EXHIBIT OCS-28	The Tribes - Stewart	9/2/81	yes	9094-introduced 9163-admitted	Excerpt: Pioneer Life Series: The White Indian Boy. Wilson.
TRIBES EXHIBIT OCS-29	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Articles of Agreement entered into at the Shoshone Indian Agency in Wyoming on September 19, 1891.
TRIBES EXHIBIT OCS-30	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Reprint from Idaho Yesterdays. "The Shoshone: Their History and Social Organization". Stewart.
TRIBES EXHIBIT OCS-31	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: 1955 Annual Report of Wyoming Game and Fish Commission.
TRIBES EXHIBIT OCS-32	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Fresh Water Fish and Fishing in Native North America. Rostlund.
TRIBES EXHIBIT OCS-33	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	February 18, 1860 report of F. W. Lander to Commissioner of Indian Affairs. Handwritten and retyped.
TRIBES EXHIBIT OCS-34	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: The Commaches: Lords of the South Plains. Wallace and Hoevel. 1952.
TRIBES EXHIBIT OCS-35	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: The Commache Barrier to South Plains Settlement. Richardson. 1933.
TRIBES EXHIBIT OCS-36	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: David Thompson's Narrative of his Explorations in Western America, 1874-1912. Tyrrell.

TRIBES EXHIBIT OCS-37	The Tribes - Stewart	9/2/81	yes	9094-introduced 9176-admitted	Excerpt: Original Journals of the Lewis and Clark Expedition. 1804-1806. Volume 3.
TRIBES EXHIBIT OCS-38	The Tribes - Stewart	9/2/81	yes	9094-introduced 9176-admitted	Excerpt: Economic Beginnings of the Far West. Vol. I. Coman.
TRIBES EXHIBIT OCS-39	The Tribes - Stewart	9/2/81	yes	9094-introduced 9178-admitted	Excerpt: Autobiography of John Paul: Member of the Wyeth Expedition to the Pacific Northwest. 1832.
TRIBES EXHIBIT OCS-40	The Tribes - Stewart	9/2/81	no	9094-introduced 9179-not admitted	Excerpt: "The Call of the Columbia", Overland to the Pacific. Vol. 4. Hulbert.
TRIBES EXHIBIT OCS-41	The Tribes - Stewart	9/2/81	yes	9094-introduced 9180-admitted	Excerpt: Adventures of Captian Bonneville. Washington Irving.
TRIBES EXHIBIT OCS-42	The Tribes - Stewart	9/2/81	yes	9094-introduced 9181-admitted	Excerpt: Historical and Statistical Information Respecting the History, Condition and Prospects of the Indian Tribes of the U.S.
TRIBES EXHIBIT OCS-43	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Wyeth's account of Indian tribes of the South Pass, et al.
TRIBES EXHIBIT OCS-44	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Journal of A Trapper. Russell.
TRIBES EXHIBIT OCS-45	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Oregon Historical Society Quarterly, Vol. XVII, "Diary of Jason Lee". 1916.
TRIBES EXHIBIT OCS-46	The Tribes - Stewart	9/2/81	yes	9094-introduced 9184-admitted	Excerpt: "Narrative of A Journey Across the Rocky Mountains", Early Western Travels, Vol 31. Townsend.
TRIBES EXHIBIT OCS-47	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: A Journey to Great Salt Lake City. Vol. II. Remy.
TRIBES EXHIBIT OCS-48	The Tribes - Stewart	9/2/81	yes	9094-introduced 9186-admitted	Excerpt: Letter of April 4, 1862 from the Secretary of the Interior regarding resolution of the House.
TRIBES EXHIBIT OCS-49	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: The Road to Oregon. Chent, 1929.
TRIBES EXHIBIT OCS-50	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Utah Historical Quarterly, "Personal recollections of Wash-a-kie, Chief of the Shoshones". Volume 1, No. 4.
TRIBES EXHIBIT OCS-51	The Tribes - Stewart	9/2/81	yes	9094-introduced 9188-admitted	Excerpt: 1869 Report of the Commissioner of Indian Affairs to the Secretary of the Interior.

TRIBES EXHIBIT OCS-52	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: 1871 Report of the Commissioner of Indian Affairs to the Secretary of the Interior.
TRIBES EXHIBIT OCS-53	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Anthropological Papers of the American Museum of Natural History. Volume II, Part II. "The Northern Shoshone". Lowie.
TRIBES EXHIBIT OCS-54	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Handbook of American Indians North of Mexico. Part 2. Hodge.
TRIBES EXHIBIT OCS-55	The Tribes - Stewart	9/2/81	yes	9094-introduced 9193-admitted	Excerpt: Wyoming Widelife Magazine, Volume III, No. 5, May, 1938. "Reservation Fishing Rules Adopted".
TRIBES EXHIBIT OCS-56	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Wyoming Fishes. Simon. Bulletin No. 4, Wyoming Game and Fish Department, 1946.
TRIBES EXHIBIT OCS-57	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Report With Respect to the House Resolution authorizing investigation of the BIA. 1952.
TRIBES EXHIBIT OCS-58	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Wyoming Wildlife, Volume XXXI, No. 11, 1967 - "With the Shoshone and Arapahoe Tribes at Wind River".
TRIBES EXHIBIT OCS-59	The Tribes - Stewart	9/2/81	yes	9094-introduced 9200-admitted	Excerpt: Annals of Wyoming, Volume 17, No. 2. 1945. Documents and letters - "Were the Verendrye Brothers the First White Men in Wyoming?"
PLS EXHIBIT WRIR MR-1	State of Wyoming - Rice	9/3/81	yes	9362-introduced 9363-admitted	Resume of Leonard Rice.
U.S. EXHIBIT WRIR LR-1	United States - Rice	9/3/81	not offered	9447-introduced	Map: Recoverable Return Flow Distribution Study Areas: Big Horn River Basin.
U.S. EXHIBIT WRIR LR-2	United States - Rice	9/3/81	not offered	9449-introduced	Map: Approximate Irrigated Acres - Year 1980: Big Horn and Clark's Fork River Basin.
U.S. EXHIBIT WRIR LR-3	United States - Rice	9/3/81	not offered	9453-introduced	Location and name of climate stations used for consumptive use studies.
U.S. EXHIBIT WRIR LR-4	United States - Rice	9/4/81	not offered	9473-introduced	Copies of flow diagram of Wyoming integrated systems operation study program.
PLS EXHIBIT WRIR MF-1	State of Wyoming - Fassett	9/4/81	yes	9540-introduced 9540-admitted	Resume of Gordon W. Fassett.
PLS EXHIBIT WRIR MF-2	State of Wyoming - Fassett	9/4/81	yes	9542-introduced 10076-admitted	Computer listing of all permit numbers in systems operation model - includes certificates of appropriation and permits.

PLS EXHIBIT WRIR MF-3A	State of Wyoming - Fassett	9/4/81	yes	9548-introduced 10076-admitted	Map: Big Horn River Basin Virgin Flow Summary.
PLS EXHIBIT WRIR MF-4(Rev)	State of Wyoming - Fassett	9/4/81	yes	9550-introduced 10076-admitted	Computer listing depicting monthly virgin flow statistics.
PLS EXHIBIT WRIR MF-5	State of Wyoming - Fassett	9/4/81	yes	9552-introduced 10076-admitted	Computer listing identifying each station contained in the model by stream.
PLS EXHIBIT WRIR MF-6A	State of Wyoming - Fassett	9/4/81	yes	9554-introduced 10076-admitted	Computer listing of return flow information for State awarded water rights in Water Division 3.
PLS EXHIBIT WRIR MF-6B	State of Wyoming - Fassett	9/4/81	yes	9554-introduced 10076-admitted	Computer listing of return flow information for each State awarded water right in Exhibit MF-6A, with United States and Tribal claims added.
PLS EXHIBIT WRIR MF-7A	State of Wyoming - Fassett	9/4/81	yes	9556-introduced 10076-admitted	Computer listing and table depicting monthly diversion requirements for each State awarded right. Also includes diversion schedules for non-consumptive use claims.
PLS EXHIBIT WRIR MF-7B	State of Wyoming - Fassett	9/4/81	yes	9556-introduced 10076-admitted	Computer listing of return flow information for each State awarded water right with U.S. and Tribal claims added. Includes diversion schedules for non-consumptive use claims.
PLS EXHIBIT WRIR MF-27	State of Wyoming - Fassett	9/21/81	yes	9585-introduced 10076-admitted	Map identifying location of USGS stream flow gauging stations.
PLS EXHIBIT WRIR MF-22	State of Wyoming - Fassett	9/21/81	yes	9586-introduced 10076-admitted	Map identifying climatic weather stations of the Basin.
PLS EXHIBIT WRIR MF-24	State of Wyoming - Fassett	9/21/81	yes	9587-introduced 10076-admitted	Map identifying location of soil conservation snow survey courses.
PLS EXHIBIT WRIR MF-26	State of Wyoming - Fassett	9/21/81	yes	9591-introduced 10076-admitted	Map identifying study areas throughout Basin used for return flow analysis and temporal distribution.
PLS EXHIBIT WRIR MF-14	State of Wyoming - Fassett	9/21/81	yes	9593-introduced 10076-admitted	Map identifying location of index map for detailed study maps used in diversion and return flow analysis.
PLS EXHIBITS WRIR MF-14-1 through MR-14-44	State of Wyoming - Fassett	9/21/81	yes	9597 through 9600-introduced 10081-admitted	Detailed study maps showing stream lengths, diversion point of State awarded water rights, location of return flow, priority date, permit number, and amount of cfs permitted for a variety of reaches.
PLS EXHIBIT WRIR MF-15	State of Wyoming - Fassett	9/21/81	yes	9606-introduced 10076-admitted	Tabulation of system operation study abbreviations assigned to each U.S. and Tribal claim.

PLS EXHIBIT WRIR MC-2(Rev)	State of Wyoming - Fassett	9/21/81	yes	9611 and 9792-introduced 10079-admitted	Administrative assumptions used for State's integrated systems operation study.
PLS EXHIBIT WRIR MF-25	State of Wyoming - Fassett	9/21/81	yes	9617-introduced 10076-admitted	Map identifying lengths of streams in operations study. Also identifies station numbers and location.
PLS EXHIBITS WRIR MF-16A and MF-16B	State of Wyoming - Fassett	9/21/81	yes	9622-introduced 10076-admitted	Computer printouts from study depicting results by month for dry year virgin flow of claims called out for diversion claims and instream flow claims, with diversion preference.
PLS EXHIBITS WRIR MF-17A and MF-17B	State of Wyoming - Fassett	9/21/81	yes	9632-introduced 10076-admitted	Computer printouts from study depicting results by month for average year virgin flow of claims called out for diversion claims and instream flow claims, with diversion preference.
PLS EXHIBITS WRIR MF-18A and MF-18B	State of Wyoming - Fassett	9/21/81	yes	9633-introduced 10076-admitted	Computer printouts from study depicting results by month for ten year study period, 1970-79, for virgin flow of claims called out for diversion claims and instream flow claims, with diversion preference.
PLS EXHIBITS WRIR MF-19A and MF-19B	State of Wyoming - Fassett	9/21/81	yes	9636-introduced 10076-admitted	Computer printouts from study depicting results by month for dry year virgin flow of claims called out for diversion claims and instream flow claims, with instream flow preference.
PLS EXHIBITS WRIR MF-20A and MF-20B	State of Wyoming - Fassett	9/21/81	yes	9640-introduced 10076-admitted	Computer printout from study depicting results by month for average year virgin flow of claims called out for diversion and instream flow claims, with instream flow preference.
PLS EXHIBITS WRIR MF-21A and MF-21B	State of Wyoming - Fassett	9/21/81	yes	9640-introduced 10076-admitted	Computer printout from study depicting results by month for ten year study period, 1970-79, for virgin flow of claims called out for diversion and instream flow claims, with instream flow preference.
PLS EXHIBIT WRIR MF-8 (2d Rev)	State of Wyoming - Fassett	9/21/81	yes	9646-introduced 10047-admitted	Printout showing effect on State awarded certificates by month for year for each right and percentage of effect before and after full application of claims by U.S. and Tribes, with diversion preference.
PLS EXHIBITS WRIR MC-1, MC-3, MC-4, MC-5	State of Wyoming - Christopulos	9/21/81	yes	9671 through 9673-introduced 9938-admitted	Lists of valid unadjudicated ditch permits, enlargement permits stock reservoir permits and reservoir permits from office of State Engineer.
U.S. EXHIBIT WRIR GC-1	United States - Christopulos	9/21/81	not offered	9729-introduced	Water Resources Inventory - 1965. Big Horn River System excerpt.
U.S. EXHIBIT WRIR GC-2	United States - Christopulos	9/21/81	not offered	9748-introduced	Wyoming Water Planning Report No. 11 - Report of Soil Conservation Service to State Engineer.

U.S. EXHIBIT WRIR GC-4	United States - Christopulos	9/21/81	not offered	9800-introduced	U.S. Department of Interior "Report of Reservoir Operations During 1975 and Annual Operating Plans for 1976."
PLS EXHIBIT WRIR MF-100	State of Wyoming - Fassett	9/22/81	yes	9829-introduced 10076-admitted	Summary tabulation of MF-16 through MF-21 series of exhibits setting out criteria used in the computer runs.
U.S. EXHIBIT WRIR GC-3	United States - Christopulos	9/22/81	not offered	9901-introduced	1965-66 State Engineer's Report. Excerpt.
U.S. EXHIBIT WRIR GC-5	United States - Christopulos	9/22/81	not offered	9914-introduced	Copy of Certificate of Appropriation and other select material for Permit No. 4087E. Includes map and aerial photos.
PLS EXHIBIT WRIR MF-9(Rev)	State of Wyoming - Fassett	9/23/81	yes	10024-introduced 10047-admitted	Computer printout showing effect on State awarded certificates by month for long term average stream conditions, using diversion preference.
PLS EXHIBIT WRIR MF-10 (2d Rev)	State of Wyoming - Fassett	9/23/81	yes	10027-introduced 10047-admitted	Computer printout showing effect on State awarded certificates by month for ten year period, 1970-79, using diversion preference.
U.S. EXHIBIT WRIR GF-3	United States - Fassett	9/28/81	not offered	10281-introduced	Copy of USGS printout of readings taken on releases from Boysen Reservoir, 1941-81.
U.S. EXHIBIT WRIR GF-1	United States - Fassett	9/28/81	yes	10330-introduced 10363-admitted	Copies of tabulations of diversion records for LeClair Canal.
U.S. EXHIRIT WRIR GF-2	United States - Fassett	9/28/81	yes	10343-introduced 10363-admitted	Annual reports of flows for Aragon Ditch. Documents from earlier deposition of Fassett.
LANDER'S EXHIBIT CLF-1	Radosevich - Fassett	9/28/81	yes	10394-introduced 10410-admitted	Hypothetical diagram of City of Lander's total monthly diversions of water for municipal use for year 1977.
PLS EXHIBITS WRIR MF-8A, MF-9A, MF-10A	State of Wyoming - Fassett	9/29/81	yes	10445-introduced 10519-admitted	Condensations of printouts contained in Plaintiff's Exhibits MF-8, MF-9 and MF-10.
PLS EXHIBIT WRIR MF-108	State of Wyoming - Fassett	9/29/81	yes	10447-introduced 10519-admitted	Affected unadjudicated permits on MF-8 (2d Rev) with total number of acres associated with permits.
PLS EXHIBIT WRIR MF-109	State of Wyoming - Fassett	9/29/81	yes	10447-introduced 10519-admitted	Affected unadjudicated permits on MF-9 (Rev) with total number of acres associated with permits.
PLS EXHIBIT WRIR MF-110-71	State of Wyoming - Fassett	9/29/81	yes	10447-introduced 10519-admitted	Affected unadjudicated permits on MF-10 (2d Rev).
PLS EXHIBIT WRIR MF-110-73	State of Wyoming - Fassett	9/29/81	yes	10447-introduced 10519-admitted	Affected unadjudicated permits on MF-10 (2d Rev).

PLS EXHIBIT WRIR MF-110-77	State of Wyoming - Fassett	9/29/81	yes	10447-introduced 10519-admitted	Affected unadjudicated permits on MF-10 (2d Rev).
PLS EXHIBIT WRIR MF-28	State of Wyoming - Fassett	9/29/81	not offered	10466-introduced	Chart of comparison of United States and State of Wyoming recoverable return flow distributions.
PLS EXHIBIT WRIR MV-1	State of Wyoming - Voeller	9/29/81	yes	10494-introduced 10519-admitted	Map of Reservation adjudicated and unadjudicated lands in the systems operation model data base.
PLS EXHIBIT WRIR MV-2A	State of Wyoming - Voeller	9/29/81	yes	10496-introduced 10519-admitted	Computer listing of permit proof numbers contained in data base and used to plot blue lands on MV-1.
PLS EXHIBIT WRIR MV-3	State of Wyoming - Voeller	9/29/81	yes	10499-introduced 10519-admitted	Volumes of certified copies of the 351 permits contained in the system operation model data base. (Vols. A, 1, 2, 3 and 4.)
PLS EXHIBIT WRIR MV-4	State of Wyoming - Voeller	9/29/81	yes	10500-introduced 10519-admitted	Oversized map of Water Division No. 3 plotting location of all adjudicated and unadjudicated permits in the Basin.
PLS EXHIBIT WRIR MV-1-8	State of Wyoming - Voeller	9/29/81	yes	10501-introduced 10519-admitted	Overlay for MV-1 depicting lands affected as listed in MF-8A.
PLS EXHIBIT WRIR MV-1-9	State of Wyoming - Voeller	9/29/81	yes	10504-introduced 10519-admitted	Map plotting lands under certificates from MF-9A.
PLS EXHIBIT WRIR MV-1-71	State of Wyoming - Voeller	9/29/81	yes	10504-introduced 10519-admitted	Map plotting lands under certificates from MF-10A.
PLS EXHIBIT WRIR MV-1-73	State of Wyoming - Voeller	9/29/81	yes	10505-introduced 10519-admitted	Map plotting lands under certificates and Permit No. 7300D from MF-10A.
PLS EXHIBIT WRIR MV-1-77	State of Wyoming - Voeller	9/29/81	yes	10505-introduced 10519-admitted	Map plotting lands under certificates and Permit No. 7300D from MF-10A.
PLS EXHIBIT WRIR MV-8A (2d Rev)	State of Wyoming - Voeller	9/29/81	yes	10507-introduced 10519-admitted	Computer listing of disposition analysis of lands - permits and certificates - affected in MF-8A by disposition statute and county.
PLS EXHIBIT WRIR MV-8B (2d Rev)	State of Wyoming - Voeller	9/29/81	yes	10507-introduced 10519-admitted	Computer listing of disposition analysis of lands - permits and certificates - affected in MF-8A by disposition statute and county for a five year array.
PLS EXHIBITS WRIR MV-9A (2d Rev), MV-9B	State of Wyoming - Voeller	9/29/81	yes	10507 and 10508-introduced 10519-admitted	Computer listings of disposition analyses of lands for average year analysis and for five-year array of MF-9A.

PLS EXHIBITS WRIR MV-71A and 71B (both 2d Rev)	State of Wyoming - Voeller	9/29/81	yes	10508-introduced 10519-admitted	Same as MV-8A and MV-8B for 1971.
PLS EXHIBITS WRIR MV-73A and 73B (both 2d Rev)	State of Wyoming - Voeller	9/29/81	yes	10509-introduced 10519-admitted	Same as MV-71A and MV-71B for 1973.
PLS EXHIBITS WRIR MV-77A and 77B (both 2d Rev)	State of Wyoming - Voeller	9/29/81	yes	10509-introduced 10519-admitted	Same as MV-71A and MV-71B for 1977.
PLS EXHIBIT WRIR MV-11	State of Wyoming - Voeller	9/29/81	yes	10510-introduced 10519-admitted	Computer disposition analysis of all lands in model. Relates to Exhibit MV-4.
PLS EXHIBIT WRIR MV-11A	State of Wyoming - Voeller	9/29/81	yes	10510-introduced 10519-admitted	Temporal array for all lands in model. Relates to Exhibit MV-4.
PLS EXHIBIT WRIR SF-A	State of Wyoming - Fowkes	9/30/81	yes	10540-introduced 10545-admitted	Resume of Clarence J. Fowkes.
PLS EXHIBIT WRIR SF-1	State of Wyoming - Fowkes	9/30/81	yes	10548-introduced 10759-admitted	Appendix D of the Wind River Irrigation Project Report, 1968. Department of Interior.
PLS EXHIBIT WRIR SF-2	State of Wyoming - Fowkes	9/30/81	yes	10548-introduced 10759-admitted	Appendix F of the Wind Division Drainage Report. Department of Interior.
PLS EXHIBIT WRIR SF-3	State of Wyoming - Fowkes	9/30/81	yes	10548-introduced 10759-admitted	Copy of Hearings of 1963 Senate Subcommittee on Irrigation and Reclamation of the Committee on the Interior.
PLS EXHIBIT WRIR SF-4(Map)	State of Wyoming - Fowkes	9/30/81	yes	10549-introduced 10759-admitted	General soils map for Fremont County.
PLS EXHIBIT WRIR SF-4 (Legend)	State of Wyoming - Fowkes	9/30/81	yes	10549-introduced 10759-admitted	Legend for SF-4 general soils map.
PLS EXHIBITS WRIR SF-5 through SF-23	State of Wyoming - Fowkes	9/30/81	yes	10550-introduced 10759-admitted	SCS soil series descriptions and form five interpretations - Apron series through Youngston Series.
PLS EXHIBIT WRIR SF-24	State of Wyoming - Fowkes	9/30/81	yes	10552-introduced 10759-admitted	Backhoe pit logs dug by Fowkes, including soil description field notes.
PLS EXHIBITS WRIR SF-25 through SF-27	State of Wyoming - Fowkes	9/30/81	yes	10553 and 10554-introduced 10759-admitted	Farmer interview forms for Paul Christianson, Jim Rumery and Charlie Deckert from Fowkes' field notes.

PLS EXHIBIT WRIR SF-29	State of Wyoming - Fowkes	9/30/81	yes	10555-introduced 10759-admitted	Notes from interview with Bruce Laymon by Sommers and Fowkes.
PLS EXHIBITS WRIR SF-2A and SF-2B	State of Wyoming - Fowkes	9/30/81	yes	10583 and 10594-introduced 10759-admitted	Large scale schematic drawings of cross-section of land illustrating various site factors testified to by Fowkes.
PLS EXHIBIT WRIR SF-28	State of Wyoming - Fowkes	9/30/81	yes	10628-introduced 10759-admitted	Diagram - soil profile schematic.
U.S. EXHIBIT WRIR CF-1	United States - Fowkes	9/30/81	yes	10662-introduced 10739-admitted	Riverton area soil survey report.
U.S. EXHIBIT WRIR CF-2	United States - Fowkes	10/1/81	yes	10680-introduced 10739-admitted	West Side Irrigation Project Study, Big Horn County, Wyoming Water Planning Program Report.
U.S. EXHIBIT WRIR CF-4	United States - Fowkes	10/1/81	yes	10700-introduced 10739-admitted	Irrigable Soils of Wyoming - Water Planning Program Report. State Engineer's office in cooperation with the State Department of Agriculture. 1974.
U.S. EXHIBIT WRIR CF-3	United States - Fowkes	10/1/81	yes	10738-introduced 10739-admitted	Report on West Side Irrigation Study. Water payment possibilities.
PLS EXHIBIT WRIR SF-30	State of Wyoming - Fowkes	10/1/81	yes	10745-introduced 10759-admitted	Overlay prepared for U.S. Exhibit WRIR C-41. Approximates location of 5500 foot elevation line.
PLS EXHIBIT WRIR SS-A1	State of Wyoming - Sommers	10/2/81	yes	10766-introduced 10791-admitted	Resume of Craig L. Sommers.
PLS EXHIBIT WRIR SS-A2	State of Wyoming - Sommers	10/2/81	yes	10769-introduced 10791-admitted	Tabulation of project acreage worked on by Sommers.
U.S. EXHIBIT WRIR CS-1	United States - Sommers	10/2/81	no	10787-introduced 10867-withdrawn	Letter to Tom Echohawk from Henry Waugh regarding evaluation of Craig Sommers' work.
PLS EXHIBIT WRIR SS-A3	State of Wyoming - Sommers	10/2/81	yes	10794-introduced 11180-admitted	Bureau of Reclamation, Land Classification Principles, 1970. Maletic.
PLS EXHIBIT WRIR SS-A4	State of Wyoming - Sommers	10/2/81	yes	10795-introduced 11180-admitted	Bureau of Reclamation, Economics and Soil Science - Copartners in Land Classification. 1963. Nielsen.
PLS EXHIBIT WRIR SS-A5	State of Wyoming - Sommers	10/2/81	yes	10797-introduced 11180-admitted	Engineering and Economic Relationships in the Selection and Classification of Irrigable Lands. Maletic. 1969.
PLS EXHIBIT WRIR SS-A6	State of Wyoming - Sommers	10/2/81	no	10797-introduced 11180-denied	Bureau of Reclamation, Ecomonic Evaluation and Selection of Lands for Irrigation. Seldon and Walker, 1968.

PLS EXHIBIT WRIR SS-A7	State of Wyoming - Sommers	10/2/81	yes	10798-introduced 11180-admitted	Bureau of Reclamation, Report on Wind Division, Wyoming Missouri River Basin Project. 1966.
PLS EXHIBIT WRIR SS-A8	State of Wyoming - Sommers	10/2/81	yes	10800-introduced 11180-admitted	Draft of Reclamation Instructions - Land Classification Techniques and Standards. Bureau of Reclamation, 1981.
PLS EXHIBIT WRIR SS-A9	State of Wyoming - Sommers	10/2/81	yes	10801-introduced 11180-admitted	Report to Regional Director, Region 6, Bureau of Reclamation, by Board of Consultants, Riverton Project, Wyoming.
PLS EXHIBIT WRIR SS-A10	State of Wyoming - Sommers	10/2/81	yes	10801-introduced 11180-admitted	Record of Sommers' field observations, September 1980, Wind River Indian Reservation.
PLS EXHIBIT WRIR SS-A11	State of Wyoming - Sommers	10/2/81	yes	10804-introduced 11180-admitted	Record of field notes and observations, April - May, 1981. Wind River Indian Reservation.
PLS EXHIBIT WRIR SS-A12	State of Wyoming - Sommers	10/2/81	yes	10805-introduced 11180-admitted	Farmer interview forms of interviews conducted by Sommers.
PLS EXHIBIT WRIR SS-A13	State of Wyoming - Sommers	10/2/81	yes	10805-introduced 11180-admitted	Telephone conversation memo of discussions by Sommers.
PLS EXHIBIT WRIR SS-A14	State of Wyoming - Sommers	10/2/81	yes	10805-introduced 11180-admitted	Request for proposal, from Owl Creek office, for Ramah Navajo Indian Reservation.
PLS EXHIBIT WRIR SS-A15	State of Wyoming - Sommers	10/2/81	yes	10806-introduced 11180-admitted	Drainage Manual, 1978, Bureau of Reclamation.
PLS EXHIBIT WRIR SS-10A	State of Wyoming - Sommers	10/2/81	yes	10807-introduced 11180-admitted	Land classification standards, Muddy Ridge Project, 3rd Division, Big Horn District, sprinkler and gravity.
PLS EXHIBIT WRIR SS-255	State of Wyoming - Sommers	10/2/81	yes	10878-introduced 11180-admitted	Compilation of arable lands by class as computed by Sommers for gravity and sprinkler systems.
PLS EXHIBITS WRIR SS-45, 45A through 45E, 145, 145A, 245	State of Wyoming - Sommers	10/2/81	yes	10887 through 10901-introduced 11180-admitted	Maps and overlays for North Crowheart, sprinkler land, depicting classification work done and Sommer's final arable land base.
PLS EXHIBITS WRIR SS-44, 44A through 44E, 144, 144A, 244	State of Wyoming - Sommers	10/2/81	yes	10903-introduced 11180-admitted	Maps and overlays for North Crowheart, gravity land, depicting classification work done and Sommer's final arable land base.
PLS EXHIBITS WRIR SS-46, 46A through 46E, 146, 146A, 246	State of Wyoming - Sommers	10/2/81	yes	10904-introduced 11180-admitted	Maps and overlays for South Crowheart, gravity land, depicting classification work done and Sommer's final arable land base.

PLS EXHIBITS WRIR SS-47, 47A through 47E. 147, 147A, 247	State of Wyoming - Sommers	10/2/81	yes	10903-introduced 11180-admitted	Maps and overlays for South Crowheart, spinkler land, depicting classification work done and Sommer's final arable land base.
PLS EXHIBITS WRIR SS-48, 48A through 48E. 148, 148A, 248	State of Wyoming - Sommers	10/2/81	yes	10905-introduced 11180-admitted	Maps and overlays for Big Horn Flats, gravity land, depicting classification work done and Sommer's final arable land base. arable land base.
PLS EXHIBITS WRIR SS-49, 49A through 49E, 149, 149A, 249	State of Wyoming - Sommers	10/2/81	yes	10905-introduced 11180-admitted	Maps and overlays for Big Horn Flats, sprinkler land, depicting classification work done and Sommer's final arable land base.
PLS EXHIBITS WRIR SS-50, 50A through 50E, 150, 150A, 250	State of Wyoming - Sommers	10/2/81	yes	10907-introduced 11180-admitted	Maps and overlays for Riverton East, gravity land, depicting classification work done and Sommer's final arable land base.
PLS EXHIBITS WRIR SS-51, 51A through 51E, 151, 151A, 251	State of Wyoming - Sommers	10/2/81	yes	10907-introduced 11180-admitted	Maps and overlays for Riverton East, sprinkler land, depicting classification work done and Sommer's final arable land base.
PLS EXHIBITS WRIR SS-53, 53A through 53E, 153, 153A, 253	State of Wyoming - Sommers	10/2/81	yes	10907-introduced 11180-admitted	Maps and overlays for Arapahoe, gravity land, depicting classification work done and Sommer's final arable land base.
PLS EXHIBITS WRIR SS-54, 54A through 54E, 154, 154A, 254	State of Wyoming - Sommers	10/2/81	yes	10908-introduced 11180-admitted	Maps and overlays for Arapahoe, sprinkler land, depicting classification work done and Sommer's final arable land base.
PLS EXHIBIT WRIR SS-9	State of Wyoming - Sommers	10/5/81	yes	10943-introduced 11180-admitted	Evaluation by Sommers of HKM Classification, as compared to Bureau of Reclamation.
PLS EXHIBIT WRIR SS-8(Rev)	State of Wyoming - Sommers	10/5/81	yes	10964-introduced 11180-admitted	Summarization by Sommers of net arable acres of Type VII (Waples) lands.
PLS EXHIBIT WRIR SS-7	State of Wyoming - Sommers	10/5/81	no	10969-introduced 10993-withdrawn	Summarization of net arable acres of Type VII (Waples) land.
PLS EXHIBIT WRIR SS-7(Rev)	State of Wyoming - Sommers	10/5/81	yes	10986-introduced 11180-admitted	Net arable acres of Type VII, adding in total for "acres claimed".

PLS EXHIBIT WRIR SS-6	State of Wyoming - Sommers	10/5/81	yes	10999-introduced 11186-admitted	Report No. 181 - Drainage Investigations - Wind River Irrigation Project - Wyoming. U.S. Department of Interior. 1965.
PLS EXHIBIT WRIR SS-H	State of Wyoming - Sommers	10/5/81	yes	11001-introduced 11180-admitted	Summarization by Sommers of net arable acres of Higginson historic fee land.
PLS EXHIBIT WRIR SS-2	State of Wyoming - Sommers	10/5/81	yes	11015-introduced 11180-admitted	Table: Adjudicated Land Analysis Summary.
U.S. EXHIBIT WRIRC-53	United States - Sommers	10/6/81	yes	11151-introduced 11161-admitted	Map for North Crowheart, sprinkler, showing in red lands excluded by Sommers as non-arable.
U.S. EXHIBITS WRIRC-S3A and S3B	United States - Sommers	10/6/81	yes	11156-introduced 11161-admitted	Overlays of Dr. Mesghinna's drainage map for North Crowheart, sprinkler - 2 parts.
PLS EXHIBIT WRIR WM-1	State of Wyoming - Martin	10/6/81	yes	11217-introduced 11222-admitted	Resume of Stephen G. Martin.
U.S. EXHIBIT WRIR SM-1	United States - Martin	10/6/81	not offered	11274-introduced	Excerpt: Instream Flow Regimens for Fish, Wildlife, Recreation and Related Environmental Resources. Tennent. 1975.
PLS EXHIBIT WRIR I&P-1	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Treaty of July 3, 1868, 15 Stat. 673.
PLS EXHIBIT WRIR I&P-2	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Treaty of September 26, 1872, 18 Stat. 291.
PLS EXHIBIT WRIR I&P-3	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Treaty of April 21, 1896, 30 Stat. 93.
PLS EXHIBIT WRIR I&P-4	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Letter, the Secretary of Interior to the Senate, transmitting 1896 Treaty, Sen. Doc. 247, 54th Congress, 1st Session.
PLS EXHIBIT WRIR I&P-5	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Act of March 3, 1905. (Treaty of April 21, 1904), 33 Stat. 1016.
PLS EXHIBIT WRIR I&P-6	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	House Committee on Indian Affairs Report No. 3700, January 19, 1905.
PLS EXHIBIT WRIR I&P-7	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Senate Committee on Indian Affairs Report No. 4263, February 21, 1905.
PLS EXHIBIT WRIR I&P-8	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Minutes of Negotiations of 1904 Treaty, April 19, 1904.

PLS EXHIBIT WRIR I&P-9	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Letter, Acting Indian Commissioner Tonnen to Secretary of the Interior Hitchcock, December 8, 1904.
PLS EXHIBIT WRIR I&P-10	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Annual Report of the Indian Commissioner for fiscal year ending June 30, 1905.
PLS EXHIBIT WRIR I&P-11	Stste of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Wyoming Act of Admission, 1890, 26 Stat. 222.
PLS EXHIBIT WRIR I&P-12	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Wyoming Constitution, Article 8, Sections 1 and 3.
PLS EXHIBIT WRIR I&P-13	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Merrill v. Bishop, 287 P.2d 620 (Wyo. 1955).
PLS EXHIBIT WRIR I&P-14	Stste of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11269-admitted	1914 Indian Appropriations Act, pertaining to Wind River Indian Reservation. 38 Stat. 582.
PLS EXHIBIT WRIR I&P-15	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	House Indian Affairs Subcommittee Report, 1913.
PLS EXHIBIT WRIR I&P-16	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Senate Committee on Indian Affairs Report, 1914.
PLS EXHIBITS WRIR I&P-17 through I&P-20	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various excerpts from 51 Congressional Record.
PLS EXHIBIT WRIR I&P-21	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Act of July 23, 1894, pertaining to Yakima Reservation. 28 Stat. 118.
PLS EXHIBIT WRIR I&P-22	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Fort Hall Treaty of February 5, 1898, 31 Stat. 672.
PLS EXHIBIT WRIR I&P-23	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	U.S. v. Hibner, 27 F.2d 909 (D. Ida. 1928).
PLS EXHIBIT WRIR I&P-24	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Crow Treaty of August 14, 1899, 33 Stat. 352.
PLS EXHIBIT WRIR I&P-25	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Anderson v. Spear-Morgan, 79 P.2d 667 (Mont. 1938).
PLS EXHIBIT WRIR I&P-26	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Klamath Treaty of June 17, 1901, 34 Stat. 325.

PLS EXHIBIT WRIR I&P-27	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	U.S. v. Adair, 478 F.Supp. 336 (D. Ore. 1979).
PLS EXHIBIT WRIR I&P-28	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Act of March 6, 1906, pertaining to Yakima Reservation, 34 Stat. 53.
PLS EXHIBIT WRIR I&P-29	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Ahtanum v. U.S., 236 F.2d 321 (9th Cir., 1956).
PLS EXHIBIT WRIR I&P-30	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Appropriations Act of June 21, 1906, pertaining to Uinta Reservation. 34 Stat. 375.
PLS EXHIBIT WRIR I&P-31	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Act of May 30, 1908, pertaining to Fort Peck Reservation. 35 Stat. 558.
PLS EXHIBIT WRIR I&P-32	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	March 1, 1907 Appropriations Act, pertaining to Blackfeet Reservation. 34 Stat. 1034.
PLS EXHIBIT WRIR I&P-33	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Tweedy v. Texas Co., 286 F. Supp. 383 (D. Mont. 1968).
PLS EXHIBIT WRIR I&P-34 through 36	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Decree and pleadings in U.S. v. Hampleman, Decree No. 753, (D. Wyo. 1916).
PLS EXHIBIT WRIR I&P-37	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Wyoming Constitution, Ordinance 3.
PLS EXHIBIT WRIR I&P-37A	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	U.S. v. Hampleman, Hampleman's Brief.
PLS EXHIBITS WRIR I&P-38, 38A, 39	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Opinion and pleadings in U.S. v. Parkins, 18 F.2d 642 (D. Wyo. 1926).
PLS EXHIBITS WRIR I&P-40 through 43	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	1894 and 1903 Annual Reports of Agents Ray and Wadsworth and correspondence.
PLS EXHIBITS WRIR I&P-44 through 56	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1903 and 1904 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBITS WRIR I&P-57 through 58 and 60 through 73	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1904 and 1905 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.

PLS EXHIBITS WRIR I&P-74 through 81	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1906 and 1907 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBITS WRIR I&P-82 through 91	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1908 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBITS WRIR I&P-92 through 94	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Annual Reports of Agent Wadsworth, August, 1905, 1906 and 1907.
PLS EXHIBITS WRIR I&P-95 through 100	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1905, 1906 and 1908 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBITS WRIR I&P-101 through 101.3220E	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	109 Applications for permits filed with State Engineer after 1905 Act (Exhibit 101 is a cover sheet and certification; Exhibits 101.6582 through 101.3220E are the applications.)
PLS EXHIBIT WRIR I&P-102	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Conrad Investment, 161 F. 829 (9th Cir., 1908).
PLS EXHIBITS WRIR I&P-103 through 110, 109A	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1910 through 1919 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBIT WRIR I&P-112	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Annual Report of Wind River Indian Reservation Shoshone School, 1911.
PLS EXHIBIT WRIR I&P-113	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Report of Interior Inspector Joe H. Norris to Secretary of the Interior, July 6, 1912.
PLS EXHIBITS WRIR I&P-114 through 121	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1909 through 1910 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBIT WRIR I&P-122	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Report of Reclamation Service Project Engineer I. B. Hosig, November, 1920.
PLS EXHIBIT WRIR I&P-123	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Three memoranda between officials of U.S. Reclamation Service, November, 1920.
PLS EXHIBITS WRIR I&P-124 through 146, 146A	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1909 through 1918 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.

PLS EXHIBITS WRIR I&P-147 through 171	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1920 through 1930 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBITS WRIR I&P-172 through 180	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1934 through 1960 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBITS WRIR I&P-181 through 186	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various letters written in 1904 through 1911 between Indian Commissioner, Secretary of the Interior, Special Agent and State Engineer.
PLS EXHIBIT WRIR I&P-187	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Colville Confederated Tribes v. Walton, 647 F.2d 42 (9th Cir., 1981).
PLS EXHIBIT WRIR I&P-188	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Winters v. U.S., 207 U.S. 564 (1908).
PLS EXHIBIT WRIR I&P-189	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Skeem v. U.S., 273 F. 93 (9th Cir., 1921).
PLS EXHIBIT WRIR I&P-190	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	U.S. v. Powers, 308 U.S. 527 (1939).
PLS EXHIBIT WRIR I&P-191	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	U.S. v. McIntire, 101 F.2d 650 (9th Cir., 1939).
PLS EXHIBIT WRIR I&P-192	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Arizona v. California, 439 U.S. 419 (1979).
PLS EXHIBIT WRIR I&P-193	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Letter, Commissioner of Indian Affairs Jones to the Secretary of the Interior, September 17, 1904.
PLS EXHIBIT WRIR I&P-194	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Report of Agent James Patten, September 1, 1877.
PLS EXHIBITS WRIR I&P-195 through 204, 204A	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various reports of Special Agents for 1880, 1881, 1884, 1886, 1887, 1892, 1895, 1897, 1898, 1899 and 1900.
PLS EXHIBITS WRIR I&P-205 through 237	State of Wyoming - Jankowski	10/7/81	yes	11288-introduced 11289-admitted	Various Congressional Acts of 1870 through 1917.
PLS EXHIBIT WRIR DS-1	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Act of April 24, 1820.

PLS EXHIBIT WRIR DS-2	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: History of Congress, April, 1820, Sales of Public Lands, pages 1865-88.
PLS EXHIBIT WRIR DS-3	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Act of September 4, 1841.
PLS EXHIBIT WRIR DS-4	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Congressional Globe, July 7, 1841, pages 126-8.
PLS EXHIBIT WRIR DS-5	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Admission Act of the State of Wyoming, July 10, 1890.
PLS EXHIBIT WRIR DS-6	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Act of May 20, 1862.
PLS EXHIBIT WRIR DS-7	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Congressional Globe, May 7, 1862, pages 1937-40.
PLS EXHIBIT WRIR DS-8	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Act of July 25, 1866.
PLS EXHIBIT WRIR DS-9	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Congressional Globe, June 18, 1866, pages 3225-29.
PLS EXHIBITS WRIR DS-10 through 13	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Various Congressional Acts of 1870 through 1891.
PLS EXHIBIT WRIR DS-14	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Congressional Record - Senate, February 27, 1877, pages 1964-74.
PLS EXHIBITS WRIR DS-15 through 17	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Various Congressional Acts of 1887 through 1894.
PLS EXHIBIT WRIR DS-18	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Report of Committee on Public Lands, April 17, 1894.
PLS EXHIBIT WRIR DS-19	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Congressional Record - House, August 10-11, 1894, pages 8391-8432.
PLS EXHIBIT WRIR DS-20	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	McKinney v. Big Horn Basin Development Company, 167 F. 770 (8th Cir. C.A., 1909).
PLS EXHIBIT WRIR DS-21	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Reclamation Act of 1936.

PLS EXHIBIT WRIR DS-22	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Report No. 1468 of House Committee on Irrigation of Arid Lands, April 7, 1902. "Reclamation of Arid Lands".
PLS EXHIBIT WRIR DS-23	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Congressional Record - House, June 12, 1902, pages 6874-80.
PLS EXHIBIT WRIR DS-24	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Act of December 29, 1916.
PLS EXHIBIT WRIR DS-25	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Report No. 35 of the House Committee on Public Lands January 11, 1916. "Stock-Raising Homesteads."
PLS EXHIBIT WRIR DS-26	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Excerpt: Congressional Record - House, December 22, 1916, pages 680-689.
PLS EXHIBITS WRIR DS-27 through 29	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Various Congressional Acts of 1905 through 1950.
PLS EXHIBIT WRIR DS-30	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Johnson v. Safeway Stores, Inc., 568 P.2d 908 (Wyo. 1977).
PLS EXHIBIT WRIR DS-31	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	United States v. Dunn, 545 F.2d 1281 (10th Cir. C.A., 1976).
PLS EXHIBIT WRIR DS-32	State of Wyoming - Devine	10/7/81	yes	11288-introduced 11289-admitted	Morton v. Mancari, 417 U.S. 599, 94 S.Ct. 2474 (1974).
TRIBES EXHIBIT OCS-40A	The Tribes - Stewart	10/20/81	yes	11386-introduced 11387-admitted	The Call of the Columbia. Full text. Supplements OCS-40.
PLS EXHIBIT WRIR AK-12	State of Wyoming - Keith	10/20/81	yes	11401-introduced 11406-admitted	Resume of Tom Keith.
PLS EXHIBIT WRIR AK-1	State of Wyoming - Keith	10/20/81	yes	11419-Introduced 11540-admitted	Map with overlays depicting classification by Keith of highest scenic quality areas of U.S. aesthetic claims.
PLS EXHIBITS WRIR AK-2 through AK-7	State of Wyoming - Keith	10/20/81	yes	11426 through 11437-introduced 11540-admitted	Photographs depicting areas covered from points 1 through 6 on Exhibit AK-1.
PLS EXHIBITS WRIR AK-8 and AK-9	State of Wyoming - Keith	10/20/81	yes	11445 and 11448-introduced 11542-admitted	Photographs of Hog Park Creek in Carbon County, West of Saratoga.
PLS EXHIBIT WRIR GW-1	State of Wyoming - Watts	10/20/81	yes	11548-introduced 11551-admitted	Resume of Gary L. Watts.

PLS EXHIBIT WRIR DP-1	State of Wyoming - Dozzi	10/21/81	yes	11633-introduced 11639-admitted	Resume of John T. "Jack" Dozzi.
PLS EXHIBIT WRIR DP-2	State of Wyoming - Dozzi	10/21/81	yes	11647-introduced 11706-admitted	9" X 9" plain piece of foam board, depicting size of an original aerial photograph negative.
PLS EXHIBIT WRIR DP-3	State of Wyoming - Dozzi	10/21/81	yes	11654-introduced 11706-admitted	30" X 30" plain piece of foam board, depicting easel enlarger for enlarging aerial photograph negatives.
PLS EXHIBITS WRIR DP-4 through DP-8	State of Wyoming - Dozzi	10/21/81	yes	11676-introduced 11706-admitted	Diagrams drawn during testimony to illustrate various aspects and concerns of scale rectification and aerial photography.
U.S. EXHIBIT WRIR JD-1	United States - Dozzi	10/21/81	yes	11687-introduced 11706-admitted	Group of documents from Horizons, Inc. to HKM Associates regarding request for scale corrected photographs.
PLS EXHIBIT WRIR MS-1	State of Wyoming - McRobbie	10/22/81	yes	11742-introduced 11743-admitted	Resume of David McRobbie.
PLS EXHIBITS WRIR MS-2 through MS-7	State of Wyoming - McRobbie	10/22/81	yes	11750 through 11773-introduced 11817-admitted	Maps - copies of U.S. Exhibits with overlays showing survey work done on various sections of land.
PLS EXHIBIT WRIR BG-1	State of Wyoming - Brogden	11/9/81	yes	11836-introduced 11885-admitted	Biographical data for Robert E. Brogden.
PLS EXHIBIT WRIR BG-4	State of Wyoming - Brogden	11/9/81	yes	11843-introduced 11885-admitted	Hand drawn sketch illustrating artesian well phenomenon.
PLS EXHIBITS WRIR BG-2 and BG-3	State of Wyoming - Brogden	11/9/81	yes	11845-introduced 11885-admitted	Excerpt: Amended statements of claims - Tribes and United States.
PLS EXHIBIT WRIR LC-1	State of Wyoming - Carver	11/9/81	yes	11892-introduced 11894-admitted	Resume of Robert D. Carver.
PLS EXHIBITS WRIR LC-2 2A through 2D, LC-3 and LC-4	State of Wyoming - Carver	11/9/81	yes	11926 through 11954-introduced 12128-admitted	Livestock Budget Economic Analysis based on 250 animal unit ranch and various tables of data used in financial analysis.
PLS EXHIBIT WRIR LC-4A	State of Wyoming - Carver	11/9/81	no	11955-introduced 12126-not offered	Figures used in LC-4, before final copy produced by Carver.
U.S. EXHIBIT WRIR RC-1	United States - Carver	11/10/81	yes	12031-introduced 12126-admitted	Soil and Range Resources Inventory. 1962.

U.S. EXHIBIT WRIR RC-2	United States - Carver	11/10/81	yes	12063-introduced 12125-admitted	Excerpt: Costs of Producing Livestock in the U.S. - final 1979, preliminary 1980, and projections for 1981. Table 18, p. 27.
U.S. EXHIBIT WRIR RC-3	United States - Carver	11/10/81	yes	12088-introduced 12125-admitted	Table 1: Cattle Prices. Another price index for 1979.
U.S. EXHIBIT WRIR RC-4	United States - Carver	11/10/81	yes	12091-introduced 12125-admitted	Alfalfa prices, indexing adjusted to 1979.
U.S. EXHIBIT WRIR RC-5	United States - Carver	11/10/81	yes	12097-introduced 12125-admitted	Input - Output Data for Cattle and Sheep Production - Extracted from State Aggregate Statistics. Kearl. 1980, p. 5.
U.S. EXHIBIT WRIR RC-6	United States - Carver	11/10/81	yes	12099-introduced 12125-admitted	Historic Steer/Calf Prices Converted to 1979 Dollars.
PLS EXHIBIT WRIR HFB-1	State of Wyoming - Bishop	11/10/81	yes	12139-introduced 12152-admitted	Personal resume of Floyd A. Bishop.
PLS EXHIBIT WRIR TH-20	State of Wyoming - Hamel	11/12/81	not offered	12283-introduced 12338-not offered	Amended Stipulation of Tribal Enrollment.
PLS EXHIBIT WRIR TH-21	State of Wyoming - Hamel	11/12/81	not offered	12284-introduced 12339-not offered	Tribal Rolls provided to State during discovery.
PLS EXHIBIT WRIR TH-19	State of Wyoming - Hamel	11/12/81	yes	12310-introduced 12339-admitted	Table Summarizing Hamel Analysis of Sutron Report (Tribes Exhibit 8) and Tribal Rolls.
PLS EXHIBITS WRIR SS-1000 through SS-1003	State of Wyoming - Sommers	11/12/81	yes	12422 through 12452-introduced 12795-admitted	Listings of nonarable lands included within unadjudicated in-use, Indian fee, and adjudicated, presently irrigated claims.
U.S. EXHIBIT WRIR CS-100	United States - Sommers	11/13/81	yes	12476-introduced 12504-admitted	Missouri River Basin Project. Wind Division Report. Department of Interior.
U.S. EXHIBIT WRIR CS-101	United States - Sommers	11/13/81	yes	12480-introduced 12504-admitted	Tabulation of Unadjudicated In-use Tracts. (Earlier version of Plaintiff's Exhibit HSO-2.)
U.S. EXHIBIT WRIR CS-102	United States - Sommers	11/13/81	yes	12485-introduced 12504-admitted	Copy of log for Hole 7, Section 31, T1N, R1W.
TRIBES EXHIBIT CS-1	The Tribes - Sommers	11/13/81	yes	12501-introduced 12505-admitted	Higginson Evaluation - Irrigated. Work paper of Sommers for analysis of Indian fee lands under irrigation.
PLS EXHIBIT WRIR DR-1	State of Wyoming - Reher	11/13/81	yes	12520-introduced 12527-admitted	Vitae of Charles Arthur Reher.

PLS EXHIBIT WRIR HSO-1	State of Wyoming - Soatrom	11/16/8I	yes	12576-introduced 12577-admitted	Resume of working experience of Henry Sostrom.
PLS EXHIBIT WRIR HSO-4	State of Wyoming - Sostrom	11/16/81	yes	12631-introduced 12795-admitted	Wyoming Evaluation of Unadjudicated Formerly In-use Type VII Land Determined Physically Irrigable Prior to Economic Analysis.
PLS EXHIBITS WRIR HSO-16 through HSO-24	State of Wyoming - Sostrom	11/16/8I	yes	12634-introduced 12795-admitted	Photographs taken by Sostrom during visit to Reservation concerning Waples' lands. Covers various tracts.
PLS EXHIBIT WRIR HSO-5	State of Wyoming - Sostrom	11/16/81	yes	12647-introduced 12795-admitted	Stream by stream summary of unadjudicated formerly in-use Type VII trust lands by drainage determined physically irrigable prior to economic analysis.
PLS EXHIBIT WRIR HSO-6	State of Wyoming - Sostrom	11/16/81	yes	12650-introduced 12795-admitted	Comparison of investment costs for Type VII lands between Stetson and Banner engineers.
PLS EXHIBIT WRIR HSO-6A	State of Wyoming - Sostrom	11/16/81	yes	12650-introduced 12795-admitted	Summary of totals of investment costs shown on HSO-6.
PLS EXHIBIT WRIR HSO-10	State of Wyoming - Sostrom	11/16/81	yes	12654-introduced 12795-admitted	Comparison of evaluations of Indian owned fee lands presently in use.
PLS EXHIBIT WRIR HSO-7 (2nd Rev)	State of Wyoming - Sostrom	11/16/81	yes	12678-introduced 12795-admitted	Evaluation of Adjudicated Trust Lands - Presently Irrigated.
PLS EXHIBIT WRIR HSO-8 (Rev)	State of Wyoming - Sostrom	11/16/81	yes	12682-introduced 12795-admitted	Evaluation of Adjudicated Trust Lands - Presently Irrigated - in Acres and by Diversion Requirement.
PLS EXHIBIT WRIR HSO-2 (2nd Rev)	State of Wyoming - Sostrom	11/16/81	no	12690-introduced 12742-not offered	Comparison of U.S. Claims by Type for Unadjudicated In-Use Lands.
PLS EXHIBIT WRIR HSO-3 (2nd Rev)	State of Wyoming - Sostrom	11/16/81	no	12692-introduced 12742-not offered	Comparison of Claims in U.S. Exhibit C-137A - Unadjudicated Trust Lands In-Use by Drainage.
PLS EXHIBIT WRIR HSO-13	State of Wyoming - Sostrom	11/16/81	yes	12707-introduced 12795-admitted	Evaluation of Unadjudicated Trust Lands, Type VII, With Water Diversion Requirement Determined Physically Irrigable Prior to Economic Analysis.
PLS EXHIBIT WRIR HSO-2A	State of Wyoming - Sostrom	11/18/81	yes	12726-introduced 12795-admitted	Revised copy of HSO-2 incorporating Circle 5 lands addressed in testimony of Sostrom.
PLS EXHIBIT WRIR HSO-3A	State of Wyoming - Sostrom	11/18/81	yes	12727-introduced 12795-admitted	Revised copy of HSO-3 incorporating Circle 5 land changes.

PLS EXHIBIT WRIR HSO-9	State of Wyoming - Sostrom	11/18/81	yes	I2734-introduced 12795-admitted	Summary - Irrigable Lands and Diversion Requirements: Comparison of U.S. and State Evaluations.
TRIBES EXHIBIT HSO-1	The Tribes - Sostrom	11/19/81	yes	12895-introduced 13052-admitted	Photocopies of portion of workbook of Higginson for fee lands with markings made by Sostrom indicating his findings.
U.S. EXHIBIT WRIR HSO-A	United States - Sostrom	11/19/81	yes	12999-introduced 13130-admitted	Hand held photographic panorama of Field 8-1.
U.S. EXHIBIT WRIR HSO-B	United States - Sostrom	11/19/81	no	13005-introduced 13131-withdrawn	Letter to Waples from Bureau of Reclamation transmitting records of Bureau reflecting currently irrigated lands in Midvale Irrigation District.
U.S. EXHIBIT WRIR HSO-C	United States - Sostrom	11/20/81	yes	13074-introduced 13130-admitted	Photograph taken by Sostrom of Fields 1-26 and 1-6.
U.S. EXHIBIT WRIR HSO-D	United States - Sostrom	11/20/81	yes	13095-introduced 13130-admitted	Photograph taken by Sostrom of Field 26-3.
PLS EXHIBIT WRIR PW-1	State of Wyoming - Wilson	12/1/81	yes	13182-introduced 13186-admitted	Resume of Paul B. Wilson.
PLS EXHIBIT WRIR PW-2	State of Wyoming - Wilson	12/1/81	yes	I3187-introduced 13248-admitted	Farming and Ranching on the Wind River Indian Reservation, Wyoming. Doctoral disertation of Wilson. 1972.
PLS EXHIBITS WRIR FSO-2A through FSO-2G	State of Wyoming - Sostrom	12/1/81	yes	13264 through 13277-introduced 13436-admitted	Maps - State Sprinkler Arable Land Base. Future projects.
PLS EXHIBITS WRIR FSO-12 and FSO-13	State of Wyoming - Sostrom	12/1/81	yes	13285-introduced 13436-admitted	Hand held photographic panoramas of Riverton East Unit, depicting red areas on FSO-2G. Parts 1 and 2.
PLS EXHIBIT WRIR FSO-1	State of Wyoming - Sostrom	12/1/81	yes	13292-introduced 13436-admitted	Description of red areas depicted on FSO-2A through 2G, describing reason for topography decision.
PLS EXHIBIT WRIR FSO-3	State of Wyoming - Sostrom	12/1/81	yes	13296-introduced 13436-admitted	Wyoming Evaluation of Irrigable Acres by Pump Station for Mesghinna Future Projects.
PLS EXHIBITS WRIR FSO-6A through FSO-6C	State of Wyoming - Sostrom	12/1/81	yes	13297-introduced 13436-admitted	Maps - State Arable Land Base for Tribes additional Future lands claim.
PLS EXHIBIT WRIR FSO-5	State of Wyoming - Sostrom	12/1/81	yes	13301-introduced 13436-admitted	Written description of potential problems in topography for FSO-6A, 6B and 6C.

PLS EXHIBIT WRIR FSO-7	State of Wyoming - Sostrom	12/1/81	yes	13301-introduced 13436-admitted	Wyoming Evaluation of Irrigable Acres by Pump Station for Bliesner Future Projects.
PLS EXHIBITS WRIR FSO-15A through FSO-15E	State of Wyoming - Sostrom	12/1/81	yes	13302-introduced 13436-admitted	Maps - State Arable Land Base for Type VIII Lands.
PLS EXHIBIT WRIR FSO-14	State of Wyoming - Sostrom	12/1/81	yes	13304-introduced 13442-admitted	Wyoming Evaluation of Future Type VIII Lands - Irrigable Acres by Pump Station. Bliesner Lands.
PLS EXHIBIT WRIR FSO-4A	State of Wyoming - Fassett	12/2/81	yes	13318-introduced 13436-admitted	Estimated construction costs per unit item of work for Mesghinna, Bliesner and Type VIII lands.
PLS EXHIBIT WRIR FSO-4	State of Wyoming - Fassett	12/2/81	yes	13325-introduced 13436-admitted	Irrigation development costs per acre for future lands - tabulated summary of FSO-4A costs.
PLS EXHIBIT WRIR FSO-4B	State of Wyoming - Fassett	12/2/81	yes	13328-introduced 13436-admitted	Table of additional construction costs of items not included in proposed future projects.
PLS EXHIBIT WRIR FSO-4C	State of Wyoming - Fassett	12/2/81	yes	13335-introduced 13436-admitted	Table of irrigation development costs per acre for Type VIII lands. Comparison.
TRIBES EXHIBIT HSF-2	The Tribes - Sostrom	12/3/81	yes	13615-introduced 13690-admitted	Sostrom's work sheet for costing main pumping plant for Big Horn Flats Extention.
TRIBES EXHIBIT HSF-3	The Tribes - Sostrom	12/3/81	yes	13620-introduced 13690-admitted	Sostrom's work sheets for steel pipeline pricing for Big Horn Flats Extension.
U.S. EXHIBIT WRIR HSO-H	United States - Sostrom	12/3/81	yes	13632-introduced 13658-admitted	Copy of computer printout summary of black and white aerial photo study for historically irrigated lands. November 4, 1981.
PLS EXHIBIT WRIR FSO-101	State of Wyoming - Sostrom	12/3/81	no	13667-introduced 13668-not admitted	Letter of September 9, 1981 from Jack Long, Manager of Midvale Irrigation District.
PLS EXHIBIT WRIR FSO-100	State of Wyoming - Sostrom	12/3/81	yes	13674-introduced 13690-admitted	Worksheets for benefit/cost ratio determined by Sostrom for five future projects.
PLS EXHIBITS WRIR HFB-1A and HFB-1B	State of Wyoming - Bishop	12/3/81	yes	13697-introduced 13829-admitted	Volumes 1 and 2, Net Irrigation and Diversion Requirements for Unadjudicated In-Use Lands on Wyoming Exhibit WRIR HSO-2.
PLS EXHIBITS WRIR HFB-2, HFB-3, HFB-4	State of Wyoming - Bishop	12/3/81	yes	13698-introduced 13829-admitted	Tabulations of net irrigation and diversion requirements for Type VII lands, presently irrigated adjudicated lands, and Indian fee lands.
PLS EXHIBIT WRIR HFB-5	State of Wyoming - Bishop	12/3/81	no	13699-introduced 13710-withdrawn	Tabulation of net irrigation and diversion requirements. Summary of historic claims.

PLS EXHIBIT WRIR FFB-1	State of Wyoming - Bishop	12/3/81	yes	13704-introduced 13829-admitted	Tabulation of net irrigation and diversion requirements for future Type VIII lands.
PLS EXHIBIT WRIR FFB-2	State of Wyoming - Bishop	12/3/81	yes	13704-introduced 13829-admitted	Summary of the requirements in Exhibit FFB-1.
PLS EXHIBIT WRIR FFB-3	State of Wyoming - Bishop	12/3/81	yes	13704-introduced 13829-admitted	Summary of net irrigation and diversion requirements for future projects.
PLS EXHIBIT WRIR HFB-5A	State of Wyoming - Bishop	12/5/81	yes	13709-introduced 13829-admitted	Update and replacement for HFB-5.
DEFS EXHIBIT CLDM-1	Radosevich - McOmie	12/7/81	yes	13330-introduced 13374-admitted	Copy of Local Public Works Capital Development and Investment Program Application for Grant to Design Water System.
DEFS EXHIBIT CLDM-2	Radosevich - McOmie	12/7/81	yes	13332-introduced 13374-admitted	Copy of Offer of Grant from E.D.A. for Public Works Project to build Lander's water treatment system.
DEFS EXHIBIT CLDM-3	Radosevich - McOmie	12/7/81	yes	13333-introduced 13374-admitted	Notice from E.D.A. regarding completion of project funding.
DEFS EXHIBIT CLDM-5	Radosevich - McOmie	12/7/81	yes	13334-introduced 13374-admitted	Copy of Farmers Home Administration Association Water or Sewer System Grant Agreement.
DEFS EXHIBIT CLDM-6	Radosevich - McOmie	12/7/81	yes	13335-introduced 13374-admitted	Copy of Certificate of Election Returns authorizing bond issue.
DEFS EXHIBIT CLDM-7	Radosevich - McOmie	12/7/81	yes	13336-introduced 13374-admitted	Ordinance authorizing City of Lander to issue General Obligation Water Bonds in the amount of $2,500,000.
DEFS EXHIBIT CLDM-8	Radosevich - McOmie	12/7/81	yes	13337-introduced 13374-admitted	Copy - Budget of City outlining bonds owned by City of Lander. Statement of Bonded Indebtedness.
DEFS EXHIBIT CLDM-4	Radosevich - McOmie	12/7/81	yes	13340-introduced 13374-admitted	Notification from Wyoming Farm Loan Board approving grant for water project.
DEFS EXHIBIT CLDM-9	Radosevich - McOmie	12/7/81	yes	13340-introduced 13374-admitted	Statement of expenditures on water system and sewer system for City of Lander to date.
DEFS EXHIBIT CLDM-10	Radosevich - McOmie	12/7/81	yes	13342-introduced 13374-admitted	Drilling Agreement authorizing drilling of water well for City of Lander. Between City and Layne - Western Company, Inc.
DEFS EXHIBIT CLDM-11	Radosevich - McOmie	12/7/81	yes	13362-introduced 13374-admitted	Letter to Bishop Randall Hospital from City of Lander regarding commitment for supply.
DEFS EXHIBIT CLRN-6	Radosevich - Nunn	12/7/81	yes	13379-introduced 13400-admitted	Map - Lander and vicinity depicting points of old and new diversion and other water treatment service locations.

DEFS EXHIBIT CLRN-1	Radosevich - Nunn	12/7/81	yes	13381-introduced 13400-admitted	Map - to accompany petition to State Board of Control for change of point of diversion and means of conveyance for City of Lander pipeline.
DEFS EXHIBIT CLRN-2	Radosevich - Nunn	12/7/81	yes	13383-introduced 13400-admitted	Graph of total monthly diversions of water for municipal use.
DEFS EXHIBIT CLRN-3	Radosevich - Nunn	12/7/81	yes	13383-introduced 13400-admitted	Numerical tabulation of values depicted in CLRN-2.
DEFS EXHIBIT CLRN-4	Radosevich - Nunn	12/7/81	yes	13383-introduced 13400-admitted	Bar graph showing totals of municipal use for City of Lander.
DEFS EXHIBIT CLRN-7	Radosevich - Nunn	12/7/81	yes	13385-introduced 13400-admitted	Graph from Water System Improvements for Lander, Wyoming, showing water requirements and location of source.
DEFS EXHIBIT CLRN-8	Radosevich - Nunn	12/7/81	yes	13389-introduced 13400-admitted	Middle Fork or Big Popo Agie River - average monthly flows.
DEFS EXHIBIT CLRN-2C	Radosevich - Nunn	12/7/81	yes	13390-introduced 13400-admitted	Comparison of City of Lander supply from Middle Fork with Federal instream flow claims applied, prorated to three branches of Popo Agie.
DEFS EXHIBIT CLRN-2D	Radosevich - Nunn	12/7/81	yes	13392-introduced 13400-admitted	Comparison of City of Lander supply from Middle Fork with Federal instream flow claims applied, using comparison with historic measured flows.
DEFS EXHIBIT CLRN-5	Radosevich - Nunn	12/7/81	yes	13395-introduced 13400-admitted	Tabulation of total monthly discharges from Lander sewage treatment in millions of gallons.
DEFS EXHIBIT WSTS-1	Radosevich - Heryford	12/7/81	yes	13420-introduced 13433-admitted	Record of Wyoming State Training School's resident population from June, 1969 to June, 1979.
DEFS EXHIBIT WSTS-2	Radosevich - Heryford	12/7/81	yes	13421-introduced 13433-admitted	Wyoming State Training School Budget for Fiscal Year 1979.
DEFS EXHIBIT WSTS-3	Radosevich - Heryford	12/7/81	yes	13423-introduced 13433-admitted	Land description for land held by Wyoming State Training School.
DEFS EXHIBIT WSTS-4	Radosevich - Heryford	12/7/81	yes	13424-introduced 13433-admitted	Crop and livestock report for Wyoming State Training School for July, 1977 through June, 1978.
DEFS EXHIBIT WSTS-5	Radosevich - Heryford	12/7/81	yes	13425-introduced 13433-admitted	Wyoming State Training School Monthly Water Usage for 1968, 1973 and 1979.
DEFS EXHIBIT WSTS-6	Radosevich - Heryford	12/7/81	yes	13425-introduced 13433-admitted	Wyoming State Training School Annual Water Usage for 1968 to 1979.

DEFS EXHIBIT WSTS-7	Radosevich - Heryford	12/7/81	yes	13429-introduced 13433-admitted	History of Federal funding for Wyoming State Training School from 1965 to present.
DEFENDANT HAMILTON WS-1 through WS-8	Smith - Hamilton	12/7/81	yes	13480-introduced 13481-admitted	Lists of permits covering adjudicated acreage owned by Hamilton.
DEFS EXHIBIT CLFB-3	Radosevich - Brownlee	12/7/81	yes	13488-introduced 13500-admitted	Farmers Home Loan Administration loans to individuals. Big Horn River.
DEFS EXHIBIT CLFB-1	Radosevich - Brownlee	12/7/81	yes	13491-introduced 13500-admitted	Cost considerations guide for loan applications.
DEFS EXHIBIT CLFB-2	Radosevich - Brownlee	12/7/81	yes	13492-introduced 13500-admitted	Example expenses - 200 acre farm - malt barley.
DEFENDANT LONGFELLOW EXHIBIT 1	Pro Se - Longfellow	12/7/81	yes	13517-introduced 13517-admitted	Plan for Completion of the Wind River Irrigation Project. Bureau of Indian Affairs. June, 1967.
DEFENDANT LONGFELLOW EXHIBIT 2	Pro Se - Longfellow	12/7/81	yes	13517-introduced 13517-admitted	Handout for distribution at proposed meetings with the Tribal Council and various other user groups with regard to completion of the Wind River Indian Irrigation Project. May, 1967.
DEFENDANT LONGFELLOW EXHIBIT 3	Pro Se - Longfellow	12/7/81	yes	13517-introduced 13517-admitted	Wind River Irrigation Project - Wyoming, Completion report update. October, 1975. Bureau of Indain Affairs.
CITY OF RIVERTON EXHIBIT 1	White - Peterson	12/7/81	yes	13530-introduced 13577-admitted	Water Information Packet. November 30, 1981.
CITY OF RIVERTON EXHIBIT 2	White - Peterson	12/7/81	yes	13567-introduced 13577-admitted	Composite of Riverton city records of historic investments by the community in water and waste water.
LECLAIR EXHIBIT 1	White - Lund	12/7/81	yes	13579-introduced 13629-admitted	Assessment Roll of LeClair Irrigation District. 1981.
LECLAIR EXHIBIT 2	White - Lund	12/7/81	yes	13581-introduced 13629-admitted	Assessment Roll analysis by parcels under one acre and parcels over one acre.
LECLAIR EXHIBIT 3	White - Lund	12/7/81	yes	13586-introduced 13629-admitted	Amendment of Permit 7300 showing map of district.
LECLAIR EXHIBIT 4	White - Lund	12/7/81	yes	13587-introduced 13629-admitted	Assessment to Indian Service at Fort Washakie per Tripartite Agreement.

LECLAIR EXHIBITS 5 through 8	White - Lund	12/7/81	yes	13590-introduced 13629-admitted	Crop Production Reports prepared by Bureau of Indian Affairs. 1977-1980.
LECLAIR EXHIBIT 11	White - Lund	12/7/81	yes	13602-introduced 13629-admitted	Water Service Contract between Bureau of Reclamation and LeClair Irrigation District. July, 1965.
LECLAIR EXHIBIT 9	White - Lund	12/7/81	yes	13605-introduced 13629-admitted	Affidavits from LeClair Irrigation District Business Manager showing amounts paid to Bureau of Reclamation on District's behalf.
LECLAIR EXHIBIT 10	White - Lund	12/7/81	yes	13607-introduced 13629-admitted	Letter from District to Department of Interior protesting development of Muddy Ridge Reclamation Project.
MIDVALE EXHIBIT 1	White - Long	12/7/81	yes	13631-introduced 13746-admitted	1981 Assessment Roll for Midvale Irrigation District.
MIDVALE EXHIBIT 2	White - Long	12/7/81	yes	13635-introduced 13746-admitted	Water Service Contract Summary for 1981.
MIDVALE EXHIBIT 3	White - Long	12/7/81	yes	13640-introduced 13746-admitted	Map of withdrawal area on Riverton Reclamation Project and proposed Muddy Ridge development.
MIDVALE EXHIBIT 4	White - Long	12/7/81	yes	13643-introduced 13746-admitted	Excerpt: Riverton Project History. 1976.
MIDVALE EXHIBIT 5	White - Long	12/7/81	yes	13658-introduced 13746-admitted	Financial Statement - Midvale Irrigation District. 1980.
MIDVALE EXHIBIT 6	White - Long	12/7/81	yes	13659-introduced 13746-admitted	1952 Repayment Contract between Bureau of Reclamation and Midvale Irrigation District.
MIDVALE EXHIBIT 7	White - Long	12/7/81	yes	13665-introduced 13746-admitted	1971 Mandatory Repayment Contract between Bureau of Reclamation and Midvale.
MIDVALE EXHIBIT 15	White - Long	12/7/81	yes	13666-introduced 13746-admitted	Certified copy of extract from February 12, 1981 meeting of the Minutes of Midvale Irrigation District.
MIDVALE EXHIBITS 8 through 11	White - Long	12/7/81	yes	13671-introduced 13746-admitted	Crop Census Production Reports. 1977-1980.
MIDVALE EXHIBIT 12	White - Long	12/7/81	yes	13675-introduced 13746-admitted	Letter to HKM upon request for tabulation of Indian lands irrigated by Midvale Irrigation District.
MIDVALE EXHIBIT 13	White - Long	12/7/81	yes	13678-introduced 13746-admitted	Letter from District to Bureau of Reclamation regarding Muddy Ridge Development and need for upstream storage.

MIDVALE EXHIBIT 14	White - Long	12/7/81	yes	13680-introduced 13746-admitted	Advertisement for Sale of lands on Riverton Reclamation Project.
MIDVALE EXHIBIT 16	White - Long	12/7/81	no	13690-introduced 13703-not admitted	Letter from Jack Long to Henry Sostrom regarding effect on Irrigation District of North Crowheart proposed project. (Same as Plaintiff's Exhibit WRIR FSO-101.)
MIDVALE EXHIBIT 17	White - Long	12/7/81	no	13694-introduced 13703-not admitted	Letter from Henry Sostrom to Jack Long requesting opinion on effects on Irrigation District of North Crowheart proposed project.
MIDVALE EXHIBIT 16	White - Long	12/8/81	yes	13709-introduced 13746-admitted	Public Law authorizing Midvale Irrigation District to create new irrigation district.
RIVERTON VALLEY EXHIBIT 1	White - Davison	12/8/81	yes	13765-introduced 13784-admitted	Assessment Roll of Riverton Valley Irrigation District for 1980.
RIVERTON VALLEY EXHIBIT 2	White - Davison	12/8/81	yes	13767-introduced 13784-admitted	Report of General Business Services on audit of Assessment Rolls for Riverton Valley Irrigation District.
RIVERTON VALLEY EXHIBIT 3	White - Davison	12/8/81	yes	13768-introduced 13784-admitted	Acreage totals map of Riverton Valley Irrigation District showing Riverton and areas of Indian property.
RIVERTON VALLEY EXHIBITS 4 through 7	White - Davison	12/8/81	yes	13769-introduced 13784-admitted	Crop Census Production Reports. 1977-1980.
RIVERTON VALLEY EXHIBIT 8	White - Davison	12/8/81	yes	13771-introduced 13784-admitted	Water Service Contract to purchase Bureau of Reclamation water from Boysen Reservoir.
RIVERTON VALLEY EXHIBIT 9	White - Davison	12/8/81	yes	13772-introduced 13784-admitted	Summary of costs from 1955 to 1981 paid to the Bureau of Reclamation on Boysen Contract.
DEFS EXHIBITS DOC-1 and DOC-2	Yonkee - Daniels	12/8/81	yes	13789-introduced 13807-admitted	Photographs of concrete ditch on witness' property.
DEFS EXHIBITS ROC-1 and ROC-2	Yonkee - Rush	12/8/81	yes	13810-introduced 13818-admitted	Photographs of pasture lands taken in August, 1981.

DEFS EXHIBIT COC-1	Yonkee - Campbell	12/8/81	yes	13829-introduced 13833-admitted	Photocopy of newspaper article pertaining to purchase of Owl Creek Anchor Dam site. 1956.
DEFS EXHIBIT COC-2	Yonkee - Campbell	12/8/81	yes	13830-introduced 13833-admitted	Photocopy of November 30, 1956 newspaper article from Billings Gazette regarding Anchor Dam site.
HOLLY SUGAR EXHIBIT 1	Scott - Yeager	12/8/81	yes	13878-introduced 13889-admitted	Costs of goods, services and taxes paid by Holly Sugar.
DEFS EXHIBIT OCU-1	Yonkee - Wilson	12/8/81	yes	13893-introduced 13928-admitted	Contract with Owl Creek Irrigation District and U.S. Bureau of Reclamation, October 28, 1955.
DEFENDANT HANOVER LH-3	Donnell - Evert	12/9/81	yes	14068-introduced 14077-admitted	1904 Articles of Agreement between the Secretary of Interior and the Governor of Wyoming.
PLS EXHIBITS WRIR LK-1 and LK-2	Bard - Keith	12/9/81	yes	14097-introduced 14103-admitted	Lists of irrigation water rights for H. D. Ranch. Parts 1 and 2.
DEAVER-WEAVER-ELK 1	Copenhaver - Churchill	12/9/81	yes	14195-introduced 14217-admitted	Public Notice for first entry on Garland Division, Shoshone Reclamation Project. 1907.
DEAVER-WEAVER-ELK 2	Copenhaver - Churchill	12/9/81	yes	14195-introduced 14217-admitted	1909 Pamphlet from U.S. Government promoting Shoshone Reclamation Project.
DEAVER-WEAVER-ELK 3	Copenhaver - Churchill	12/9/81	yes	14196-introduced 14217-admitted	Public Notice for entry on Frannie Division, 1917.
DEAVER-WEAVER-ELK 4	Copenhaver - Churchill	12/9/81	yes	14196-introduced 14217-admitted	Public Notice for entry on Wilwood Division, 1927.
DEAVER-WEAVER-ELK 5	Copenhaver - Churchill	12/9/81	yes	14197-introduced 14217-admitted	1909 photograph depicting irrigation in Powell area on demonstration farm.
DEAVER-WEAVER-ELK 6	Copenhaver - Churchill	12/9/81	yes	14197-introduced 14217-admitted	1917 photograph showing settlers arriving by train.
DEAVER-WEAVER-ELK 7	Copenhaver - Churchill	12/9/81	yes	14198-introduced 14217-admitted	1920 photograph of U.S. Bureau of Reclamation headquarters building on Shoshone Project.
DEAVER-WEAVER-ELK 9	Copenhaver - Churchill	12/9/81	yes	14198-introduced 14217-admitted	1935 photograph of Shoshone project land.
DEAVER-WEAVER-ELK 13	Copenhaver - Churchill	12/9/81	yes	14199-introduced 14217-admitted	Dams, Ditches and Water, A History of Shoshone Reclamation Project. Churchill.

DEAVER-WEAVER-ELK 12	Copenhaver - Churchill	12/9/81	yes	14200-introduced 14217-admitted	Photograph of farm land taken in 1980.
DEAVER-WEAVER-ELK 21	Copenhaver - Churchill	12/9/81	yes	14200-introduced 14217-admitted	1980 photograph of malt barley production.
DEAVER-WEAVER-ELK 8	Copenhaver - Churchill	12/9/81	yes	14201-introduced 14217-admitted	1977 photograph of Bent Street, Powell, Wyoming.
DEAVER-WEAVER-ELK 10	Copenhaver - Churchill	12/9/81	yes	14201-introduced 14217-admitted	1944 photograph of Main Street, Powell, Wyoming.
DEAVER-WEAVER-ELK 11	Copenhaver - Churchill	12/9/81	yes	14201-introduced 14217-admitted	1944 photo of industrial district of Powell, Wyoming.
DEAVER-WEAVER-ELK 22	Copenhaver - Churchill	12/9/81	yes	14202-introduced 14217-admitted	1975 photo of Powell business district.
DEAVER-WEAVER-ELK 14 through 17	Copenhaver - Churchill	12/9/81	yes	14202 through 14204-introduced 14217-admitted	"The Powell-Tribune Looks at Agriculture." Various additions from 1976-1980.
DEAVER-WEAVER-ELK 18	Copenhaver - Churchill	12/9/81	yes	14206-introduced 14217-admitted	Original Notice of Adjudication of certain permits. Powell-Tribune, Tuesday, March 31, 1964.
DEAVER-WEAVER-ELK 19	Anderson - Calvin	12/9/81	yes	14369-introduced 14371-admitted	Schedule of contracted construction charge repayment obligations - Shoshone Project.
DEAVER-WEAVER-ELK 20	Anderson - Calvin	12/9/81	yes	14370-introduced 14371-admitted	Schedule of Shoshone Project construction costs.
WEBER EXHIBIT 1	Barrett - Weber	12/14/81	yes	14421-introduced 14435-admitted	Group of letters regarding "Indian Water Rights" from Duncan case.
WEBER EXHIBIT 2	Barrett - Weber	12/14/81	yes	14424-introduced 14435-admitted	Letter of July 21, 1912 from Commissioner of Indian Affairs.
WEBER EXHIBIT 3	Barrett - Weber	12/14/81	yes	14424-introduced 14435-admitted	Certified map of 1913 showing Duncan ditches.
WEBER EXHIBIT 4	Barrett - Weber	12/14/81	yes	14426-introduced 14435-admitted	Map of unadjudicated permits and allotment land.
WEBER EXHIBIT 5	Barrett - Weber	12/14/81	yes	14430-introduced 14435-admitted	Decree and Stipulation, Hampleman case.

WEBER EXHIBIT 6	Barreti - Weber	12/14/81	yes	14431-introduced 14435-admitted	Certificate of Appropriation, Proof No. 24513.
WEBER EXHIBIT 7	Barrett - Weber	12/14/81	yes	14433-introduced 14435-admitted	Letter of 1957 regarding irrigation on Duncan lands.
WEBER EXHIBIT 8	Barrett - Weber	12/14/81	yes	14436-introduced 14435-admitted	Affidavit of Bertha Jones, 1981.
PLS EXHIBIT WRIR EB-1	State of Wyoming - Brookshire	12/14/81	yes	14491-introduced 14500-admitted	Vitae of David S. Brookshire.
U.S. EXHIBIT WRIR EB-1	United States - Brookshire	12/14/81	yes	14499-introduced 14644-admitted	Excerpts from Economics, 11th Edition. Samuelson.
PLS EXHIBIT WRIR EB-2	State of Wyoming - Brookshire	12/14/81	yes	14517-introduced 14652-admitted	Economic considerations for PIA.
PLS EXHIBIT WRIR EB-3	State of Wyoming - Brookshire	12/14/81	yes	14523-introduced 14652-admitted	The Issue of Social Discount Rates. Brookshire.
TRIBES EXHIBIT DB-1	The Tribes - Brookshire	I2/14/81	yes	14552-introduced 14602-admitted	Excerpt: "Rates of Return by Industrial Section in the United States, 1948-76." Fraumeni and Jorgenson. May, 1980.
TRIBES EXHIBIT DB-2	The Tribes - Brookshire	12/14/81	yes	14599-introduced 14602-admitted	Pages 13240-13270 from transcript of Arizona v. California.
TRIBES EXHIBITS DB-3 and DB-4	The Tribes - Brookshire	12/14/81	yes	14595 and 14600-introduced 14602-admitted	Lake Powell Research Project Bulletins Nos. 28 and 33. September and November, 1976.
TRIBES EXHIBIT DB-5	The Tribes - Brookshire	12/14/81	yes	14572-introduced 14602-admitted	"Benefit-Cost Evaluation of Long Term Future Effects: The Case of CO_2." April, 1980.
TRIBES EXHIBIT DB-6	The Tribes - Brookshire	12/14/81	yes	14582-introduced 14602-admitted	"Intergenerational Ethics and the Depletion of Fossil Fuels." July, 1979.
TRIBES EXHIBIT DB-7	The Tribes - Brookshire	12/14/81	yes	14575-introduced 14602-admitted	"Economics and Ethics: Evaluating the Risks of Storing Nuclear Waste." June, 1981.
TRIBES EXHIBIT DB-8	The Tribes - Brookshire	t2/14/81	yes	14572-introduced 14602-admitted	"Long Term Nuclear Waste Storage: An Economic and Ethical Perspective."

TRIBES EXHIBIT DB-9	The Tribes - Brookshire	12/14/81	yes	14600-introduced 14602-admitted	"Valuing the Risks and Environmental Impacts of Energy Development." December, 1980.
TRIBES EXHIBIT DB-10	The Tribes - Brookshire	12/14/81	yes	14579-introduced 14602-admitted	"Methods Development for Valuing Hazard Information." October, 1980.
PLS EXHIBIT WRIR EJ-1	State of Wyoming - Jacobs	12/15/81	yes	14668-introduced 14684-admitted	Curriculum Vitae of James Jacobs.
PLS EXHIBIT WRIR EJ-2	State of Wyoming - Jacobs	12/15/81	yes	14692-introduced 15059-admitted	Sensitivity Analysis of Dornbusch's Economic Evaluation.
PLS EXHIBITS WRIR EJ-3 and EJ-4	State of Wyoming - Jacobs	12/15/81	yes	14706-introduced 15059-admitted	Analyses of Future Projects and Type VIII Lands with Discount Rates of 7-1/8% and 4%.
PLS EXHIBITS WRIR EJ-6, EJ-7 and EJ-8	State of Wyoming - Jacobs	12/15/81	yes	14707 through 14719-introduced 15059-admitted	Long term average crop yields, start up crop yields, and cropping patterns and prices.
PLS EXHIBITS WRIR EJ-10 and EJ-11	State of Wyoming - Jacobs	12/15/81	yes	14736 and 14745-introduced 15059-admitted	Benefit-costs ratios by project area for good and superior management.
PLS EXHIBITS WRIR EJ-12 and EJ-13	State of Wyoming - Jacobs	12/15/81	yes	14746 and 14748-introduced 15059-admitted	Comparison of Jacob's present value of benefits with Stetson's present value of costs at 4% and Keiler's present value of costs at 4%.
PLS EXHIBIT WRIR EJ-14 and EJ-15	State of Wyoming - Jacobs	12/15/81	yes	14759 and 14760-introduced 15059-admitted	Analyses of Type VII Lands with discount rates of 7-1/8% and 4%.
PLS EXHIBITS WRIR EJ-16 and EJ-17	State of Wyoming - Jacobs	12/15/81	yes	14760 and 14790-introduced 15059-admitted	Economically feasible Type VII lands, assuming 7-1/8% and 4% discount rate and superior management.
U.S. EXHIBIT WRIR JJ-1	United States - Jacobs	12/15/81	yes	14842-introduced 15059-admitted	Table of machinery and equipment by hours per year for low and high elevation.
U.S. EXHIBIT WRIR JJ-2	United States - Jacobs	12/15/81	yes	14856-introduced 15059-admitted	Estimated crop and livestock production costs, Nebraska, 1981.
U.S. EXHIBIT WRIR JJ-3	United States - Jacobs	12/15/81	yes	14878-introduced 15059-admitted	Comparison of equipment hours used.

U.S. EXHIBIT WRIR JJ-4	United Statea - Jacobs	12/15/81	yes	14883-introduced 15059-admitted	Price of tractors for 1979 and 1980. National Farm Tractor and Implement Blue Book.
U.S. EXHIBIT WRIR JJ-5	United States - Jacobs	12/15/81	yes	14891-introduced 15059-admitted	Table of farm machinery and implement prices.
U.S. EXHIBIT WRIR JJ-6	United States - Jacobs	12/16/81	yes	14911-introduced 15060-admitted	Excerpt: Plan for Completion of the Wind River Irrigation Project. Bureau of Indian Affairs, 1968.
U.S. EXHIBITS WRIR JJ-7, JJ-8 and JJ-9	United States - Jacobs	12/16/81	yes	14929 through 14934-introduced 15060-admitted	Interview forms, cattle ranching and stocker cattle, from field notes of Jacobs. Interviews nos. 2, 9 and 13.
U.S. EXHIBIT WRIR JJ-10	United States - Jacobs	12/16/81	yes	14937-introduced 15060-admitted	Appendix 4, Wyoming Answers to U.S. Fifth Interrogatories.
TRIBES EXHIBIT WRIR JJ-1	The Tribes - Jacobs	12/16/81	yes	15042-introduced 15061-admitted	Page from Water and Power Instructions for Bureau of Reclamation Series 110.
PLS EXHIBIT WRIR BB-I	State of Wyoming - Bryans	12/16/81	yes	15071-introduced 15073-admitted	Resume of Robert Bryans.
PLS EXHIBIT WRIR MV-1000	State of Wyoming - Voeller	12/17/81	not offered	15180-introduced	Description of four basic land status date alternatives.
PLS EXHIBITS WRIR MF-2000 through 2004, 2001A & B, 2002A & B 2003A & B, 2004A & B	State of Wyoming - Fassett	12/17/81	yes	15181 and 15187-introduced 15216-admitted	Table of organization of various alternative computer runs. Computer printouts of affected water rights tabulated by Fassett Model for Federal Alternatives I through IV, with and without economic analysis.
PLS EXHIBITS WRIR MF-2001-RF through 2004-RF, 2001A-RF & B-RF, 2002A-RF & B-RF 2003A-RF & B-RF 2004A-RF & B-RF	State of Wyoming - Fassett	12/17/81	yes	15200-introduced 15216-admitted	Series of data output by month for long term conditions in cfs for flow of river, for assumptions corresponding to set of exhibits above.
PLS EXHIBIT WRIR EA-1	State of Wyoming - Agee	12/18/81	yes	15308-introduced 15309-admitted	Resume of Douglas E. Agee.
PLS EXHIBIT WRIR EA-2	State of Wyoming - Agee	12/18/81	yes	15315-introduced 15424-admitted	Probabilities of Freeze in Wyoming. Agricultural Experiment Station Bulletin 381R. December, 1977.

PLS EXHIBIT WRIR EA-3	State of Wyoming - Agee	12/18/81	yes	15321-introduced 15424-admitted	Growing Degree Days in Wyoming. Bulletin 655. August, 1977.
PLS EXHIBITS WRIR EA-4 and EA-5	State of Wyoming - Agee	12/18/81	yes	15346 and 15353-introduced 15424-admitted	Tables of malt barley and alfalfa costs comparisons - Dornbusch, Jacobs and Agee.
PLS EXHIBITS WRIR EA-6 and EA-7	State of Wyoming - Agee	12/18/81	yes	15357 and 15361-introduced 15424-admitted	Summary comparison of cost and returns of malt barley and alfalfa budgets.
PLS EXHIBIT WRIR EA-8	State of Wyoming - Agee	12/18/81	yes	15362-introduced 15424-admitted	Economies of Size in U.S. Field Crop Farming. U.S. Department of Agriculture, Report No. 472.
U.S. EXHIBIT WRIR DA-1	United States - Agee	12/18/81	yes	15401-introduced 15411-admitted	Cover letter and supplement to Hardin Unit reformulated farm budget analyses.
PLS EXHIBIT WRIR SR-3	State of Wyoming - Voeller	12/18/81	yes	15426-introduced 15555-admitted	Tabulation of U.S. and Tribes claims for which state awarded water rights have been obtained. Sticken, p. 15468.
PLS EXHIBIT WRIR SR-3 (Rev)	State of Wyoming - Voeller	12/18/81	yes	15467-introduced 15468-admitted	Replaces Plaintiff's Exhibit SR-3.
PLS EXHIBITS WRIR SR-1, SR-1A through 1C	State of Wyoming - Voeller	12/18/81	yes	15426-introduced 15555-admitted	Land status map of northern half of Reservation with three overlays.
PLS EXHIBITS WRIR SR-2, SR-2A through 2C	State of Wyoming - Voeller	12/18/81	yes	15426-introduced 15555-admitted	Land status map of southern half of Reservation with three overlays.
PLS EXHIBITS WRIR SR-1D and SR-2D	State of Wyoming - Voeller	12/18/81	yes	15467-introduced 15468-admitted	Supplement Plaintiff's Exhibits SR-1 and SR-2. Depict overlay between lands with State awarded water rights at some time, and claims.
PLS EXHIBIT WRIR SR-4	State of Wyoming - Voeller	12/18/81	yes	15432-introduced 15555-admitted	Single mass diagram of cumulative acres of applied permits as compared to acres claimed.
PLS EXHIBIT WRIR SR-7	State of Wyoming - Voeller	12/18/81	yes	15437-introduced 15555-admitted	Chronological analysis of state awarded water rights.
PLS EXHIBIT WRIR SR-5	State of Wyoming - Voeller	12/18/81	yes	15438-introduced 15555-admitted	Single mass diagram corresponding to SR-7.

PLS EXHIBITS WRIR SR-8 and SR-9	State of Wyoming - Voeller	12/18/81	yes	15438 and 15439-introduced 15555-admitted	Lists of cancelled and uncancelled permits and certificates on Reservation made on behalf of the Tribes.
PLS EXHIBIT WRIR MV-3000	State of Wyoming - Voeller	12/18/81	yes	15442-introduced 15555-admitted	Table showing reduction in lands affected by Fassett 2000 series exhibits.
U.S. EXHIBIT WRIR R-1	United States - Goldfeld	2/19/82	yes	15472-introduced 15527-admitted	Curriculum vitae of Steven M. Goldfeld.
U.S. EXHIBIT WRIR R-2	United States - Goldfeld	2/19/82	not offered	15495-introduced	Rates of return by industrial sector, 1948-1976. Fraumeni and Jorgenson. (Same as Tribes Exhibit DB-1.)